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GOOGLE LLC

**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA**

ANIBAL RODRIGUEZ, et al. individually and on  
behalf of all others similarly situated,

Plaintiff,

vs.

GOOGLE LLC,

Defendant.

Case No. 3:20-CV-04688-RS

**APPENDIX A IN SUPPORT OF  
GOOGLE LLC'S MOTION FOR  
SUMMARY JUDGMENT –  
EVIDENTIARY SUPPORT**

Date: July 11, 2024

Time: 1:30 p.m.

Courtroom: 3, 17th Floor

Judge: Hon. Richard Seeborg

Action Filed: July 14, 2020

Trial Date: February 10, 2025

## **APPENDIX A – EVIDENTIARY SUPPORT**

Appendix A contains the evidentiary support that Google’s Motion For Summary Judgment relies upon. Other than Tabs A-2, A-16, and A-23, the documents contained in Appendix A have previously been filed in this litigation.<sup>1</sup>

<b>CITATION</b>	<b>ECF</b>	<b>PDF PAGES</b>	<b>DOCUMENT DESCRIPTION</b>
Appx. A-1	ECF 65	4 - 34	Sample of Historic Google Analytics for Firebase Terms of Service and Google Analytics for Firebase Use Policy
Appx. A-2	N/A	35 - 103	Additional Selection of Historic Google Analytics for Firebase Terms of Service (2016 to present)
Appx. A-3	ECF 315-5	104 - 106	Declaration of Sal Cataldo in Support of Class Certification
Appx. A-4	ECF 315-6	107 - 109	Declaration of Susan Harvey in Support of Class Certification
Appx. A-5	ECF 315-7	110 - 112	Declaration of Anibal Rodriguez in Support of Class Certification
Appx. A-6	ECF 315-8	113 – 115	Declaration of Julian Santiago in Support of Class Certification
Appx. A-7	ECF 323-1	116 - 181	Selection of Historic Privacy Policies (2016 to Present)
Appx. A-8	ECF 324-1	182 – 186	“Google Analytics,” screenshotted on August 24, 2023 from <a href="https://firebase.google.com/docs/analytics">https://firebase.google.com/docs/analytics</a>
Appx. A-9	ECF 324-4	187 – 194	“[GA4] Automatically collected events,” screenshotted on August 24, 2023 from <a href="https://support.google.com/firebase/answer/9234069?hl=en">https://support.google.com/firebase/answer/9234069?hl=en</a>
Appx. A-10 <sup>2</sup>	ECF 361-13	195 – 197	Excerpt of “GEO Privacy Champion,” GOOG-RDGZ-00161364
Appx. A-11	ECF 361-58	198 - 223	Excerpts of the Expert Report of Jonathan Hochman

<sup>1</sup> Google has separately provided the court with an Appendix B, which includes unredacted versions of certain documents from Appendix A. The court has already ruled on whether the unredacted material should be sealed. The versions of these documents that were filed publicly—after the Court’s respective Orders on sealing—are all found in Appendix A.

<sup>2</sup> Unredacted at Appx. B-2.

CITATION	ECF	PDF PAGES	DOCUMENT DESCRIPTION
Appx. A-12 <sup>3</sup>	ECF 361-59	224 – 238	Expert Report of Jonathan E. Hochman, Appendix E (Ad Campaigns and Conversion Tracking/Modeling)
Appx. A-13 <sup>4</sup>	ECF 364-1	239 – 267	Google’s Responses to Plaintiff’s Interrogatory No. One
Appx. A-14 <sup>5</sup>	ECF 364-2	268 – 286	“App Attribution in GAA,” GOOG-RDGZ-00056514
Appx. A-15	ECF 364-3	287 – 291	Excerpts from the Deposition Transcript of Steve Ganem
Appx. A-16	N/A	292 – 295	App’x X-4 to Rebuttal Expert Report of John Black, Ph.D. - Selection of Historic Google Policies Prohibiting “Fingerprinting”
Appx. A-17	ECF 364-6	296 – 300	Excerpts from the Deposition Transcript of Sal Cataldo
Appx. A-18	ECF 364-7	301 – 304	Excerpts from the Deposition Transcript of Belinda Langner
Appx. A-19	ECF 364-17	305 – 311	Excerpts from the Deposition Transcript of Michael J. Lasinski
Appx. A-20	ECF 364-19	312 – 324	Excerpts from the Deposition Transcript of Jonathan Hochman
Appx. A-21	ECF 364-20	325 – 327	Excerpt of the Rebuttal Expert Report of John R. Black, Ph.D
Appx. A-22	ECF 364-22	328 – 333	Google’s Responses to Interrogatories Nos. 15 & 16
Appx. A-23	N/A	334 - 339	“Log Events,” screenshotted on March 27, 2024 from <a href="https://firebase.google.com/docs/analytics/events?platform=android">https://firebase.google.com/docs/analytics/events?platform=android</a>

<sup>3</sup> Unredacted at Appx. B-1.

<sup>4</sup> Unredacted at Appx. B-3.

<sup>5</sup> Unredacted at Appx. B-4.

# Appendix A-1



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**UNITED STATES DISTRICT COURT**  
**NORTHERN DISTRICT OF CALIFORNIA**  
**SAN FRANCISCO**

ANIBAL RODRIQUEZ AND JULIE ANNA  
MUNIZ, individually and on behalf of all other  
similarly situated,

Plaintiff,

vs.

GOOLGLE LLC,

Defendant.

Case No. 3:20-CV-04688

**DECLARATION OF ANDREW ROPE  
IN SUPPORT OF DEFENDANT  
GOOGLE LLC'S MOTION TO  
DISMISS FIRST AMENDED  
COMPLAINT**

Date: February 25, 2021

Time: 1:30 p.m.

Court: Courtroom 3 – 17th Floor

Hon. Richard Seeborg

1 I, Andrew Rope, declare as follows:

2 1. I am a senior project manager on the legal team at Google LLC, defendant in the  
3 above-captioned matter. I have personal knowledge of the facts set forth below and, if called as a  
4 witness in a court of law, could and would testify competently thereto.

5 2. Attached hereto as **Exhibit 1(a)-(b)** are true and correct copies of the Google  
6 Analytics for Firebase Terms of Service agreements in effect in 2019 and 2020, which were  
7 downloaded on October 8, 2020 at:

8 [https://firebase.google.com/terms/analytics#previous\\_versions](https://firebase.google.com/terms/analytics#previous_versions)  
9 <https://firebase.google.com/terms/analytics/20181001>.

10 3. Attached hereto as **Exhibit 2(a)-(b)** are true and correct copies of the Google  
11 Analytics for Firebase Use Policies in effect in 2019 and 2020, which were downloaded on October  
12 8, 2020 at:

13 <https://firebase.google.com/policies/analytics>  
14 <https://firebase.google.com/policies/analytics/2017-05-17>.

15 I declare under penalty of perjury that the foregoing is true and correct. Executed on October 13,  
16 2020 at Aptos, California.

17 By:   
18 Andrew Rope  
19  
20  
21

# EXHIBIT 01-A

(<https://google.com/racialequity>)

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

**Terms last modified: April 17, 2019** | [Previous versions](#) (#previous\_versions)

These Google Analytics for Firebase Terms of Service are entered into by the entity or individual using the Service ("**You**") and:

(A) if Your address is in any country within Europe, the Middle East, or Africa: Google Ireland Limited ("**Google**"), with offices at Gordon House, Barrow Street, Dublin 4, Ireland;

(B) if Your address is in a country within the Asia Pacific region: Google Asia Pacific Pte. Ltd. ("**GAP**"), of 70 Pasir Panjang Road, #03-71, Mapletree Business City II, Singapore 117371, unless Your address is in one of the following countries, in which case the specified entity as a reseller:

- Australia: Google Australia Pty Ltd of Level 5, 48 Pirrama Road, Pyrmont 2009, NSW, Australia
- New Zealand: Google New Zealand Limited of PWC Tower, Level 27, 188 Quay Street, Auckland, New Zealand 1010
- Japan: Google Japan G.K. of Roppongi Hills Mori Tower, 6-10-1, Roppongi, Minato-ku, Tokyo, Japan

("Google Reseller") and references to "**Google**" mean Google LLC, GAP, Google Reseller, and/or their affiliates, depending on the context; or

(C) if Your address is anywhere else in the world: Google LLC ("**Google**"), with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043.

This Agreement (as defined below) governs Your use of Google Analytics for Firebase (the "**Service**"). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. You confirm that you will comply with the

Google Analytics for Firebase Policies (<https://firebase.google.com/policies/analytics>) and that you have separately entered the Google API Terms of Service (<https://developers.google.com/terms/>) with Google LLC (which, along with the Google Analytics for Firebase Terms of Service and the Google Analytics for Firebase Policies (<https://firebase.google.com/policies/analytics/>), mean the "**Agreement**"). The parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service.

**"Affiliate(s)"** means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

**"SDK"** means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics). Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at [www.google.com/privacy.html](http://www.google.com/privacy.html)), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and



regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at [www.google.com/policies/privacy/partners/](http://www.google.com/policies/privacy/partners/), or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.



## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED \$500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to

the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, service marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

### 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

### 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics) ([//firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics)), the Google Analytics for Firebase Policies at [firebase.google.com/policies/analytics](https://firebase.google.com/policies/analytics) ([//firebase.google.com/policies/analytics](https://firebase.google.com/policies/analytics)), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that

party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United

Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

#### Previous versions

- [Oct 1, 2018 \(/terms/analytics/20181001\)](/terms/analytics/20181001)
- [May 17, 2017 \(/terms/analytics/20170517\)](/terms/analytics/20170517)
- [May 18, 2016 \(/terms/analytics/20160518\)](/terms/analytics/20160518)

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# EXHIBIT 01-B

(<https://google.com/racialequity>)

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

This is an archive. For the current version of this page, head to [Google Analytics for Firebase Terms of Service](#) ([is/analytics](#)).

## Terms last modified: Oct 1, 2018

These Google Analytics for Firebase Terms of Service, the [Google Analytics for Firebase Policies](#) (/policies/analytics) and the [Google API Terms of Service](#) (//developers.google.com/terms/) (this "**Agreement**") are entered into by Google and the entity or individual using the Service ("**You**"). This Agreement governs Your use of Google Analytics for Firebase (the "**Service**"). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

"**Account**" refers to the account for the Service.

"**Affiliate(s)**" means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

"**Confidential Information**" includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

**"Google"** means (i) Google Ireland Limited, with offices at Gordon House, Barrow Street, Dublin 4, Ireland, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within Europe, the Middle East, or Africa ("EMEA"), (ii) Google Asia Pacific Pte. Ltd., with offices at 70 Pasir Panjang Road, #03-01, Mapletree Business City II, Singapore 117371 (or its affiliate reseller(s)), if Your principal place of business (for entities) or place of residence (for individuals) is in any country within the Asia Pacific region ("APAC"), or (iii) Google LLC, with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043, if Your principal place of business (for entities) or place of residence (for individuals) is in any country in the world other than those in EMEA and APAC.

**"SDK"** means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."



## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics). Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at [www.google.com/privacy.html](http://www.google.com/privacy.html)), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at [www.google.com/policies/privacy/partners/](http://www.google.com/policies/privacy/partners/), or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection

with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED \$500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the

express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, service marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

### 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

### 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

### 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics) ([//firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics)), the Google Analytics for Firebase Policies at [firebase.google.com/policies/analytics](https://firebase.google.com/policies/analytics) ([//firebase.google.com/policies/analytics](https://firebase.google.com/policies/analytics)), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective

no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or



documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates.

The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16 and 17.

#### Previous versions

- [May 17, 2017](/terms/analytics/20170517) (/terms/analytics/20170517)
- [May 18, 2016](/terms/analytics/20160518) (/terms/analytics/20160518)

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# EXHIBIT 02-A

(<https://google.com/racialequity>)

# Google Analytics for Firebase Use Policy

**Last modified: December 20, 2019** | [Previous versions](#) (#previous\_versions)

We have modified the Terms of Service and Policies to replace the term "Firebase Analytics" with "Google Analytics for Firebase."

By enabling Google Analytics for Firebase you enable the collection of data about App Users, including via [identifiers for mobile devices](https://www.google.com/policies/technologies/ads/) (including Android Advertising ID and Advertising Identifier for iOS), cookies and similar technologies.

You will not facilitate the merging of personally-identifiable information with non-personally identifiable information unless you have robust notice of, and the user's prior affirmative (i.e., opt-in) consent to, that merger.

You are required to notify your App Users by disclosing the following information:

- The Google Analytics for Firebase features you have implemented.
- How you and third-party vendors use first-party cookies, or other first-party identifiers, and third-party cookies and similar technologies, such as identifiers for mobile devices (including Android Advertising ID and Advertising Identifier for iOS), or other third-party identifiers, together.
- How App Users can opt-out of the Google Analytics for Firebase features you use, including through applicable device settings, such as the device advertising settings for mobile apps, or any other available means.

## European Union User Consent Policy

You must comply with the [European Union User Consent Policy](https://www.google.com/about/company/user-consent-policy.html). (<https://www.google.com/about/company/user-consent-policy.html>).

## Interest-based advertising

If you use Google Analytics for Firebase to collect sensitive information about your visitors, including information described in the [Google AdWords sensitive category restrictions](https://support.google.com/adwordspolicy/answer/143465#sensitive) ([//support.google.com/adwordspolicy/answer/143465#sensitive](https://support.google.com/adwordspolicy/answer/143465#sensitive)), you may not use Google Analytics for Firebase to collect data for the purpose of interest based advertising.

Because laws across countries and territories vary, and because Google Analytics for Firebase can be used in many ways, Google is unable to provide the exact language you need to include in your privacy policy. Only you understand the unique aspects and special considerations of your business, and your privacy policy should account for this information that only you can provide.

## Policy Against Fingerprints and Locally Shared Objects

You must comply with the [Policy Against Fingerprints and Locally Shared Objects](https://support.google.com/analytics/answer/9682282) ([//support.google.com/analytics/answer/9682282](https://support.google.com/analytics/answer/9682282)).

## Previous versions

- [May 17, 2017](https://policies/analytics/2017-05-17) (/policies/analytics/2017-05-17)
- [May 18, 2016](https://policies/analytics/2016-05-18) (/policies/analytics/2016-05-18)

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Last updated 2020-08-21 UTC.

# EXHIBIT 02-B

(<https://google.com/racialequity>)

# Google Analytics for Firebase Use Policy

This is an archive. For the current version of this page, head to [Google Analytics for Firebase Use Policy](#).  
cies/analytics).

**Last updated: May 17, 2017**

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By enabling Google Analytics for Firebase you enable the collection of data about App Users, including via [identifiers for mobile devices](#) ([//www.google.com/policies/technologies/ads/](https://www.google.com/policies/technologies/ads/)) (including Android Advertising ID and Advertising Identifier for iOS), cookies and similar technologies.

You will not facilitate the merging of personally-identifiable information with non-personally identifiable information unless you have robust notice of, and the user's prior affirmative (i.e., opt-in) consent to, that merger.

You are required to notify your App Users by disclosing the following information:

- The Google Analytics for Firebase features you have implemented.
- How you and third-party vendors use first-party cookies, or other first-party identifiers, and third-party cookies and similar technologies, such as identifiers for mobile devices (including Android Advertising ID and Advertising Identifier for iOS), or other third-party identifiers, together.
- How App Users can opt-out of the Google Analytics for Firebase features you use, including through applicable device settings, such as the device advertising settings for mobile apps, or any other available means.

## European Union User Consent Policy

You must comply with the [European Union User Consent Policy](#).

([//www.google.com/about/company/user-consent-policy.html](http://www.google.com/about/company/user-consent-policy.html)).

## Interest-based advertising

If you use Google Analytics for Firebase to collect sensitive information about your visitors, including information described in the [Google AdWords sensitive category restrictions](#) ([//support.google.com/adwordspolicy/answer/143465#sensitive](http://support.google.com/adwordspolicy/answer/143465#sensitive)), you may not use Google Analytics for Firebase to collect data for the purpose of interest based advertising.

Because laws across countries and territories vary, and because Google Analytics for Firebase can be used in many ways, Google is unable to provide the exact language you need to include in your privacy policy. Only you understand the unique aspects and special considerations of your business, and your privacy policy should account for this information that only you can provide.

Last Updated: 2017/05/17 ([View the archived version](#) (/policies/analytics/2016-05-18))

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Last updated 2020-08-21 UTC.

# Appendix A-2

**Google Analytics for Firebase  
Terms of Service, last updated  
May 18, 2016, downloaded on  
March 28, 2024, available at:  
[https://web.archive.org/  
web/20170307063138/https://  
firebase.google.com/terms/  
analytics](https://web.archive.org/web/20170307063138/https://firebase.google.com/terms/analytics)**



The Wayback Machine - <https://web.archive.org/web/20170307063138/https://firebase.google.com/terms/analyt...>

# FIREBASE ANALYTICS TERMS OF SERVICE

These Firebase Analytics Terms of Service, the [Firebase Analytics Policies](https://web.archive.org/web/20170307063138/https://firebase.google.com/policies/analyt...)

([//web.archive.org/web/20170307063138/https://firebase.google.com/policies/analyt...](https://web.archive.org/web/20170307063138/https://firebase.google.com/policies/analyt...)) and the

[Google API Terms of Service](https://web.archive.org/web/20170307063138/https://firebase.google.com/terms/)

([//web.archive.org/web/20170307063138/https://firebase.google.com/terms/](https://web.archive.org/web/20170307063138/https://firebase.google.com/terms/)) (this "**Agreement**")

are entered into by Google and the entity or individual using the Service ("**You**"). This

Agreement governs Your use of Firebase Analytics (the "**Service**"). BY CLICKING THE "I

ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE,

YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE

AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS

ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service.

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**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

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**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

**"Google"** means either (i) Google Ireland Limited, with offices at Gordon House, Barrow Street, Dublin 4, Ireland, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within Europe, the Middle East, or Africa ("EMEA"), (ii) Google Asia Pacific Pte. Ltd., with offices at 8 Marina View Asia Square 1 #30-01 Singapore 018960, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within the Asia Pacific region ("APAC"), or (iii) Google Inc., with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043, if Your principal place of business (for entities) or place of residence (for individuals) is in any country in the world other than those in EMEA and APAC.

**"SDK"** means the Firebase Analytics Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

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**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics). Unless otherwise

stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

### 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

### 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

### 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at [www.google.com/privacy.html](http://www.google.com/privacy.html)), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at [www.google.com/policies/privacy/partners/](http://www.google.com/policies/privacy/partners/), or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED \$500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

### 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

### 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

### 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics)

([//web.archive.org/web/20170307063138/https://firebase.google.com/terms/analytics](https://web.archive.org/web/20170307063138/https://firebase.google.com/terms/analytics)), the Firebase Analytics Policies at [firebase.google.com/policies/analytics](https://firebase.google.com/policies/analytics)

([//web.archive.org/web/20170307063138/https://firebase.google.com/policies/analytics](https://web.archive.org/web/20170307063138/https://firebase.google.com/policies/analytics)), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.



## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in



advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google Inc., 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16 and 17.

Last Updated: 2016/05/18

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*Last updated February 1, 2017.*

**Google Analytics for Firebase  
Terms of Service, last updated  
May 17, 2017, downloaded on  
March 28, 2024, available at:  
[https://web.archive.org/  
web/20200812055821/https://  
firebase.google.com/terms/  
analytics/20170517](https://web.archive.org/web/20200812055821/https://firebase.google.com/terms/analytics/20170517)**

Google is committed to advancing racial equity for Black communities. [See how.](https://web.archive.org/web/20200812055821/https://google.com/racialequity)  
(<https://web.archive.org/web/20200812055821/https://google.com/racialequity>)

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

This is an archive. For the current version of this page, head to [Google Analytics for Firebase Terms of Service](https://firebase.google.com/terms/analytics) (/20200812055821/https://firebase.google.com/terms/analytics).

**Terms last modified: May 17, 2017**

These Google Analytics for Firebase Terms of Service, the [Google Analytics for Firebase Policies](https://web.archive.org/web/20200812055821/https://firebase.google.com/policies/analytics) (/web/20200812055821/https://firebase.google.com/policies/analytics) and the [Google API Terms of Service](https://web.archive.org/web/20200812055821/https://developers.google.com/terms/) (/web.archive.org/web/20200812055821/https://developers.google.com/terms/) (this "**Agreement**") are entered into by Google and the entity or individual using the Service ("**You**"). This Agreement governs Your use of Google Analytics for Firebase (the "**Service**"). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service.

**"Affiliate(s)"** means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

**"Google"** means either (i) Google Ireland Limited, with offices at Gordon House, Barrow Street, Dublin 4, Ireland, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within Europe, the Middle East, or Africa ("EMEA"), (ii) Google Asia Pacific Pte. Ltd., with offices at 70 Pasir Panjang Road, #03-01, Mapletree Business City II, Singapore 117371, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within the Asia Pacific region ("APAC"), or (iii) Google LLC, with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043, if Your principal place of business (for entities) or place of residence (for individuals) is in any country in the world other than those in EMEA and APAC.

**"SDK"** means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

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which will be posted at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics). Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

### 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

### 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

### 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

### 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at [www.google.com/privacy.html](http://www.google.com/privacy.html)), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at [www.google.com/policies/privacy/partners/](http://www.google.com/policies/privacy/partners/), or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and

all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL



CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED \$500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, serve marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

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## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights

pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of

Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

Last Updated: 2017/05/17 ([View the archived version](#))

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**Google Analytics for Firebase  
Terms of Service, last updated  
October 1, 2018, downloaded on  
March 28, 2024, available at:  
[https://web.archive.org/  
web/20200813203704/https://  
firebase.google.com/terms/  
analytics/20181001](https://web.archive.org/web/20200813203704/https://firebase.google.com/terms/analytics/20181001)**

The Wayback Machine - <https://web.archive.org/web/20200813203704/https://firebase.google.com/terms/analytics>  
(<https://web.archive.org/web/20200813203704/https://google.com/racialequity>)

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

This is an archive. For the current version of this page, head to [Google Analytics for Firebase Terms of Service](https://firebase.google.com/terms/analytics) (/20200813203704/https://firebase.google.com/terms/analytics).

## Terms last modified: Oct 1, 2018

These Google Analytics for Firebase Terms of Service, the [Google Analytics for Firebase Policies](https://web.archive.org/web/20200813203704/https://firebase.google.com/policies/analytics) (/web/20200813203704/https://firebase.google.com/policies/analytics) and the [Google API Terms of Service](https://web.archive.org/web/20200813203704/https://developers.google.com/terms/) (/web.archive.org/web/20200813203704/https://developers.google.com/terms/) (this "**Agreement**") are entered into by Google and the entity or individual using the Service ("**You**"). This Agreement governs Your use of Google Analytics for Firebase (the "**Service**"). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service.

**"Affiliate(s)"** means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is

already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

**"Google"** means (i) Google Ireland Limited, with offices at Gordon House, Barrow Street, Dublin 4, Ireland, if Your principal place of business (for entities) or place of residence (for individuals) is in any country within Europe, the Middle East, or Africa ("EMEA"), (ii) Google Asia Pacific Pte. Ltd., with offices at 70 Pasir Panjang Road, #03-01, Mapletree Business City II, Singapore 117371 (or its affiliate reseller(s)), if Your principal place of business (for entities) or place of residence (for individuals) is in any country within the Asia Pacific region ("APAC"), or (iii) Google LLC, with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043, if Your principal place of business (for entities) or place of residence (for individuals) is in any country in the world other than those in EMEA and APAC.

**"SDK"** means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.



The words "**include**" and "**including**" mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics). Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

## 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.



## 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

## 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at [www.google.com/privacy.html](http://www.google.com/privacy.html)), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at [www.google.com/policies/privacy/partners/](http://www.google.com/policies/privacy/partners/), or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of

cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED \$500 (USD).

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express written consent of Google and its Affiliates ; (f) register, attempt to register, or assist anyone else to register any trademark, trade name, service marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

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[firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics)

([//web.archive.org/web/20200813203704/https://firebase.google.com/terms/analytics](https://web.archive.org/web/20200813203704/https://firebase.google.com/terms/analytics)), the Google Analytics for Firebase Policies at [firebase.google.com/policies/analytics](https://firebase.google.com/policies/analytics)

([//web.archive.org/web/20200813203704/https://firebase.google.com/policies/analytics](https://web.archive.org/web/20200813203704/https://firebase.google.com/policies/analytics)), or other

policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

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existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

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attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16 and 17.

### Previous versions

- [May 17, 2017](https://web.archive.org/web/20200813203704/https://firebase.google.com/terms/analytics/20170517) (/web/20200813203704/https://firebase.google.com/terms/analytics/20170517)
- [May 18, 2016](https://web.archive.org/web/20200813203704/https://firebase.google.com/terms/analytics/20160518) (/web/20200813203704/https://firebase.google.com/terms/analytics/20160518)

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**Google Analytics for Firebase  
Terms of Service, last updated  
April 17, 2019, downloaded on  
March 28, 2024, available at:  
[https://web.archive.org/  
web/20230405151442/https://  
firebase.google.com/terms/  
analytics/](https://web.archive.org/web/20230405151442/https://firebase.google.com/terms/analytics/)**



The Wayback Machine - <https://web.archive.org/web/20190910123710/https://firebase.google.com/terms/analytics>

# GOOGLE ANALYTICS FOR FIREBASE TERMS OF SERVICE

**Terms last modified: April 17, 2019** | [Previous versions](#) (#previous\_versions)

These Google Analytics for Firebase Terms of Service are entered into by the entity or individual using the Service ("**You**") and:

(A) if Your address is in any country within Europe, the Middle East, or Africa: Google Ireland Limited ("**Google**"), with offices at Gordon House, Barrow Street, Dublin 4, Ireland;

(B) if Your address is in a country within the Asia Pacific region: Google Asia Pacific Pte. Ltd. ("**GAP**"), of 70 Pasir Panjang Road, #03-71, Mapletree Business City II, Singapore 117371, unless Your address is in one of the following countries, in which case the specified entity as a reseller:

- Australia: Google Australia Pty Ltd of Level 5, 48 Pirrama Road, Pyrmont 2009, NSW, Australia
- New Zealand: Google New Zealand Limited of PWC Tower, Level 27, 188 Quay Street, Auckland, New Zealand 1010
- Japan: Google Japan G.K. of Roppongi Hills Mori Tower, 6-10-1, Roppongi, Minato-ku, Tokyo, Japan

("Google Reseller") and references to "**Google**" mean Google LLC, GAP, Google Reseller, and/or their affiliates, depending on the context; or

(C) if Your address is anywhere else in the world: Google LLC ("**Google**"), with offices at 1600 Amphitheatre Parkway, Mountain View, California 94043.

This Agreement (as defined below) governs Your use of Google Analytics for Firebase (the "**Service**"). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS

ACCOUNT. You confirm that you will comply with the Google Analytics for Firebase Policies

(<https://web.archive.org/web/20190910123710/https://firebase.google.com/policies/analytics>)

and that you have separately entered the Google API Terms of Service

(<https://web.archive.org/web/20190910123710/https://developers.google.com/terms/>) with Google LLC (which, along with the Google Analytics for Firebase Terms of Service and the Google Analytics for Firebase Policies

(<https://web.archive.org/web/20190910123710/https://firebase.google.com/policies/analytics/>),

mean the "**Agreement**"). The parties agree as follows:

## 1. Definitions.

"**Account**" refers to the account for the Service.

"**Affiliate(s)**" means in relation to each of the parties: (a) any parent company of that party; and (b) any corporate body of which that party directly or indirectly has control or which is directly or indirectly controlled by the same person or group of persons as that party.

"**Confidential Information**" includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

"**Customer Data**" means the data You collect, process or store using the Service concerning the characteristics and activities of Users.

"**Documentation**" means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

"**SDK**" means the Firebase Software Development Kit, which is used or incorporated in an App for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**"Processing Software"** means the Google server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"App"** means any app or other resource that sends data to the Service. Each App must be under Your control.

**"Privacy Policy"** means the privacy policy on an App.

**"Report"** means the resulting analysis made available to You.

**"Servers"** means the servers controlled by Google or its Affiliates on which the Processing Software and Customer Data are stored.

**"Software"** means the SDK and the Processing Software.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (i) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users of Your Apps.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

Google and its Affiliates may change its fees and payment policies for the Service from time to time. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics). Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google and its Affiliates will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

## 3. Member Account, Password, and Security.

To register for the Service, You must be acting in the course of business, complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full

responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google or its Affiliates' support staff may, from time to time, log in to the Service under Your Account in order to maintain or improve service, including to provide You assistance with technical or billing issues. By creating Your Account you agree to receive electronic statements from Google and its Affiliates.

#### 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the SDK solely as necessary for You to use the Service on Your Apps or Third Parties Apps; and (b) You may remotely access, view and download Your Reports. You will not (and You will not allow any third party to) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations and Your agreements with third parties in Your use of and access to the Documentation, Software, Service and Reports.

#### 5. Confidentiality.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information if permitted by law.

#### 6. Information Rights and Publicity.

Google and its Affiliates may retain and use, subject to the terms of its privacy policy (located at [www.google.com/privacy.html](http://www.google.com/privacy.html)), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii)

concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

## 7. Privacy.

You will not, and will not assist or permit any third party to, pass information to Google that Google could use or recognize as personally identifiable information. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection, usage and sharing of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology that are used to collect data. You must disclose the use of the Service, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at [www.google.com/policies/privacy/partners/](http://www.google.com/policies/privacy/partners/), or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features that are part of the Service.

Your access to and use of any other DoubleClick or Google service is subject to the applicable terms between You and Google regarding that service.

## 8. Indemnification.

To the maximum extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its Affiliates, at Your expense, from any and all

third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or Affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or Affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any claim, suit or action from which You must indemnify Google and its Affiliates. You will cooperate as fully as reasonably required in the defense of any claim. Google and its Affiliates reserve the right, at their own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

## 9. Third Parties.

If You use the Service on behalf of a Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google and its Affiliates may share with the Third Party any Customer Data that is specific to the Third Party's Apps, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

## 10. DISCLAIMER OF WARRANTIES.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF

MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NON-INFRINGEMENT. THE SERVICE IS PROVIDED "AS IS".

## 11. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST PROFITS (WHETHER DIRECT OR INDIRECT) OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE LOSSES OR DAMAGES (WHETHER OR NOT FORESEEABLE OR CONTEMPLATED BY THE PARTIES), EVEN IF GOOGLE OR ITS AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE AND ITS AFFILIATES' TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED \$500 (USD).

## 12. Proprietary Rights Notice.

The Service, which includes the Software and all intellectual property rights therein are, and will remain, the property of Google and its Affiliates. All rights in and to the Software not expressly granted to You in this Agreement are reserved and retained by Google, its Affiliates, and its licensors without restriction, including, Google's (and its Affiliates') right to sole ownership of the Software and Documentation. Without limiting the generality of the foregoing, You agree, to the maximum extent permitted by applicable law, not to (and not to allow any third party to): (a) sublicense, distribute, or use the Service or Software outside of the scope of the license granted in this Agreement; (b) copy, modify, adapt, translate, prepare derivative works from, reverse engineer, disassemble, or decompile the Software or Documentation or otherwise attempt to discover any source code or trade secrets related to the Service; (c) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (d) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; (e) use the trademarks, trade names, service marks, logos, domain names and other distinctive brand features or any copyright or other proprietary rights associated with the Service for any purpose without the express written consent of Google and its Affiliates ; (f) register,



attempt to register, or assist anyone else to register any trademark, trade name, service marks, logos, domain names and other distinctive brand features, copyright or other proprietary rights associated with Google or its Affiliates other than in the name of Google (or its Affiliates as the case may be); (g) remove, obscure, or alter any notice of copyright, trademark, or other proprietary right appearing in or on any item included with the Service or Software or (h) seek, in a proceeding filed during the term of this Agreement or for one year after such term, an injunction of any portion of the Service based on patent infringement.

### 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

### 14. Term and Termination.

Either party may terminate this Agreement at any time with notice. Upon any termination of this Agreement, Google will stop providing, and You will stop using the Service. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

### 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at [firebase.google.com/terms/analytics](https://firebase.google.com/terms/analytics)

([//web.archive.org/web/20190910123710/https://firebase.google.com/terms/analytics](https://web.archive.org/web/20190910123710/https://firebase.google.com/terms/analytics)), the Google Analytics for Firebase Policies at [firebase.google.com/policies/analytics](https://firebase.google.com/policies/analytics)



(<https://web.archive.org/web/20190910123710/https://firebase.google.com/policies/analytics>), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of the Service. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Applicable Law and Venue.

(a) Except as set forth in Sections 16(b) and (c) below, all claims arising out of or relating to this Agreement or the Services ("Disputes") will be governed by California law, excluding California's conflict of laws rules, and all Disputes will be litigated exclusively in the federal or state courts of Santa Clara County, California, USA, and You and Google consent to personal jurisdiction in those courts.

(b) If Your principal place of business (for entities) or place of residence (for individuals) is in any country within APAC (other than Australia, Japan, New Zealand or Singapore) or Latin America, this Section 16(b) will apply instead of Section 16(a) above. ALL DISPUTES (AS DEFINED ABOVE) WILL BE GOVERNED BY CALIFORNIA LAW, EXCLUDING CALIFORNIA'S CONFLICT OF LAWS RULES. The parties will try in good faith to settle any Dispute within 30 days after the Dispute arises. If the Dispute is not resolved within 30 days, it must be resolved by arbitration by the American Arbitration Association's International Centre for Dispute Resolution in accordance with its Expedited Commercial Rules in force as of the date of this Agreement ("Rules"). The parties will mutually select one arbitrator. The arbitration will be conducted in English in Santa Clara County, California, USA. Either party may apply to any competent court for injunctive relief necessary to protect its rights pending resolution of the arbitration. The arbitrator may order equitable or injunctive relief consistent with the remedies and limitations in this Agreement. Subject to the confidentiality requirements in Section 5, either party may petition any competent court to issue any order necessary to protect that party's rights or property; this petition will not be considered a violation or waiver of this governing law and arbitration section and will not affect the arbitrator's powers, including the power to review the judicial decision. The parties stipulate that the courts of Santa Clara County, California, USA, are competent to grant any order

under this subsection. The arbitral award will be final and binding on the parties and its execution may be presented in any competent court, including any court with jurisdiction over either party or any of its property. Any arbitration proceeding conducted in accordance with this section will be considered Confidential Information under this Agreement's confidentiality section, including (i) the existence of, (ii) any information disclosed during, and (iii) any oral communications or documents related to the arbitration proceedings. The parties may also disclose the information described in this section to a competent court as may be necessary to file any order under this section or execute any arbitral decision, but the parties must request that those judicial proceedings be conducted in camera (in private). The parties will pay the arbitrator's fees, the arbitrator's appointed experts' fees and expenses, and the arbitration center's administrative expenses in accordance with the Rules. In its final decision, the arbitrator will determine the non-prevailing party's obligation to reimburse the amount paid in advance by the prevailing party for these fees. Each party will bear its own lawyers' and experts' fees and expenses, regardless of the arbitrator's final decision.

(c) If Your principal place of business (for entities) or place of residence (for individuals) is in Greece, all Disputes (as defined above) will be governed by Greek law and the parties submit to the exclusive jurisdiction of the courts of Athens in relation to any Dispute.

## 17. Miscellaneous

Google and its Affiliates will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. Certain laws of the jurisdiction in which you reside may confer rights and remedies and imply terms into this Agreement that cannot be excluded. Those rights, remedies, and implied terms are not excluded by this Agreement. To the extent that the relevant laws permit Google to limit their operation, Google's liability under those laws will be limited at its option, to the supply of the services

again, or payment of the cost of having the services supplied again. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. Google may assign or otherwise transfer this Agreement to any of its Affiliates. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 , 7, 8, 9, 10, 11, 12, 14, 16 and 17.

#### Previous versions

- Oct 1, 2018  
(/web/20190910123710/https://firebase.google.com/terms/analytics/20181001)
- May 17, 2017  
(/web/20190910123710/https://firebase.google.com/terms/analytics/20170517)
- May 18, 2016  
(/web/20190910123710/https://firebase.google.com/terms/analytics/20160518)

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**Google Analytics Terms of Service, last updated June 17, 2019, downloaded on March 28, 2024, available at <https://web.archive.org/web/20231225155302/https://marketingplatform.google.com/about/analytics/terms/gb-20190617/>**

## Marketing Platform

Please note that these terms have been modified.

# Google Analytics Terms of Service

These Google Analytics Terms of Service (this "**Agreement**") are entered into by Google LLC ("**Google**") and the entity executing this Agreement ("**You**"). This Agreement governs Your use of the standard Google Analytics (the "**Service**"). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT. In consideration of the foregoing, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service. All Profiles (as applicable) linked to a single Property will have their Hits aggregated before determining the charge for the Service for that Property.

**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** or "Google Analytics Data" means the data you collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available online.

**"GAMC"** means the Google Analytics Measurement Code, which is installed on a

Google serves cookies to analyse traffic to this site. Information about your use of our site is shared with Google for that purpose. [See details](#) [OK, got it](#)

## Marketing Platform

be a call to the Service by various libraries, but does not have to be so (e.g., a Hit can be delivered to the Service by other Google Analytics-supported protocols and mechanisms made available by the Service to You).

**"Platform Home"** means the user interface through which You can access certain Google Marketing Platform-level functionality.

**"Processing Software"** means the Google Analytics server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**"Profile"** means the collection of settings that together determine the information to be included in, or excluded from, a particular Report. For example, a Profile could be established to view a small portion of a web site as a unique Report.

**"Property"** means any web page, application, other property or resource under Your control that sends data to Google Analytics.

**"Privacy Policy"** means the privacy policy on a Property.

**"Report"** means the resulting analysis shown at [www.google.com/analytics/](http://www.google.com/analytics/), some of which may include analysis for a Profile.

**"Servers"** means the servers controlled by Google (or its wholly-owned subsidiaries) on which the Processing Software and Customer Data are stored.

**"SDKs"** mean certain software development kits, which may be used or incorporated into a Property app for the purpose of collecting Customer Data, together with any fixes, updates, and upgrades provided to You.

**"Software"** means the Processing Software, GAMC and/or SDKs.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (ii) for which You use the Service to collect information on the third party's behalf.

**"Users"** means users and/or visitors to Your Properties.

The words **"include"** and **"including"** mean "including but not limited to."

## 2. Fees and Service.

Subject to Section 15, the Service is provided without charge to You for up to 10 million

hits per month. For more information, see [Google Analytics pricing](#).

Google serves cookies to analyse traffic to this site. Information about your use of our site is shared with Google for that purpose. [See details](#) [OK, got it](#)

## Marketing Platform

or those changes which will be posted at [www.google.com/analytics/](http://www.google.com/analytics/). Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including attorneys' fees) incurred by Google will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your AdWords account.

### 3. Member Account, Password, and Security.

To register for the Service, You must complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under Your Account. You will notify Google immediately upon learning of any unauthorized use of Your Account or any other breach of security. Google's (or its wholly-owned subsidiaries) support staff may, from time to time, log in to the Service under Your customer password in order to maintain or improve service, including to provide You assistance with technical or billing issues.

### 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the GAMC and/or SDKs solely as necessary for You to use the Service on Your Properties or Third Party's Properties; and (b) You may remotely access, view and download Your Reports stored at [www.google.com/analytics/](http://www.google.com/analytics/). You will not (and You will not allow any third party to) (i) copy, modify, adapt, translate or otherwise create derivative works of the Software or the Documentation; (ii) reverse engineer, decompile, disassemble or otherwise attempt to discover the source code of the Software, except as expressly permitted by the law in effect in the jurisdiction in which You are located; (iii) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (iv) remove any proprietary notices or labels on the Software or placed by the Service; (v) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; or (vi) use data

Google serves cookies to analyse traffic to this site. Information about your use of our site is shared with Google for that purpose. [See details](#) [OK, got it](#)

## Marketing Platform

### 5. Confidentiality and Beta Features.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information. Certain Service features are identified as "Alpha," "Beta," "Experiment," (either within the Service or elsewhere by Google) or as otherwise unsupported or confidential (collectively, **"Beta Features"**). You may not disclose any information from Beta Features or the terms or existence of any non-public Beta Features. Google will have no liability arising out of or related to any Beta Features.

### 6. Information Rights and Publicity.

Google and its wholly owned subsidiaries may retain and use, subject to the terms of its privacy policy (located at <https://www.google.com/policies/privacy/>), information collected in Your use of the Service. Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

### 7. Privacy.

You will not and will not assist or permit any third party to, pass information to Google

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for iOS) or similar technology used to collect data. You must disclose the use of Google Analytics, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses data when you use our partners' sites or apps", (located at [www.google.com/policies/privacy/partners/](http://www.google.com/policies/privacy/partners/), or any other URL Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

You must not circumvent any privacy features (e.g., an opt-out) that are part of the Service. You will comply with all applicable Google Analytics policies located at [www.google.com/analytics/policies/](http://www.google.com/analytics/policies/) (or such other URL as Google may provide) as modified from time to time (the "**Google Analytics Policies**").

You may participate in an integrated version of Google Analytics and certain Google advertising services ("Google Analytics Advertising Features"). If You use Google Analytics Advertising Features, You will adhere to the Google Analytics Advertising Features policy (available at [support.google.com/analytics/bin/answer.py?hl=en&topic=2611283&answer=2700409](http://support.google.com/analytics/bin/answer.py?hl=en&topic=2611283&answer=2700409)). Your access to and use of any Google advertising service is subject to the applicable terms between You and Google regarding that service.

If You use the Platform Home, Your use of the Platform Home is subject to the Platform Home Additional Terms (or as subsequently re-named) available at <https://support.google.com/marketingplatform/answer/9047313> (or such other URL as Google may provide) as modified from time to time (the "Platform Home Terms").

## 8. Indemnification.

To the extent permitted by applicable law, You will indemnify, hold harmless and defend Google and its wholly-owned subsidiaries, at Your expense, from any and all third-party claims, actions, proceedings, and suits brought against Google or any of its officers, directors, employees, agents or affiliates, and all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by Google or any of its officers, directors, employees, agents or affiliates, arising out of or relating to (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable

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Your obligations of privacy to any Third Party; and (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports.

Google will provide You with written notice of any claim, suit or action from which You must indemnify Google. You will cooperate as fully as reasonably required in the defense of any claim. Google reserves the right, at its own expense, to assume the exclusive defense and control of any matter subject to indemnification by You.

### 9. Third Parties.

If You use the Service on behalf of the Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google may share with the Third Party any Customer Data that is specific to the Third Party's Properties, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

### 10. DISCLAIMER OF WARRANTIES.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NONINFRINGEMENT.

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## 13. U.S. Government Rights.

If the use of the Service is being acquired by or on behalf of the U.S. Government or by a U.S. Government prime contractor or subcontractor (at any tier), in accordance with 48 C.F.R. 227.7202-4 (for Department of Defense (DOD) acquisitions) and 48 C.F.R. 2.101 and 12.212 (for non-DOD acquisitions), the Government's rights in the Software, including its rights to use, modify, reproduce, release, perform, display or disclose the Software or Documentation, will be subject in all respects to the commercial license rights and restrictions provided in this Agreement.

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Additionally, if Your Account and/or Properties are terminated, You will (i) delete all copies of the GAMC from all Properties and/or (ii) suspend any and all use of the SDKs within 3 business days of such termination. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at <https://www.google.com/analytics/terms/>, the Google Analytics Policies at [www.google.com/analytics/policies/](http://www.google.com/analytics/policies/), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use Google Analytics. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Miscellaneous, Applicable Law and Venue.

Google will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder

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personal jurisdiction of the courts located in Santa Clara County, California. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. The Software is controlled by U.S. Export Regulations, and it may be not be exported to or used by embargoed countries or individuals. Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. A waiver of any default is not a waiver of any subsequent default. You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 (except the last two sentences), 7, 8, 9, 10, 11, 12, 14, 16, and 17.

## 17. Google Analytics for Firebase.

If You link a Property to Firebase ("**Firestore Linkage**") as part of using the Service, the following terms, in addition to Sections 1-16 above, will also apply to You, and will also govern Your use of the Service, including with respect to Your use of Firestore Linkage. Other than as modified below, all other terms will stay the same and continue to apply. In the event of a conflict between this Section 17 and Sections 1-16 above, the terms in Section 17 will govern and control solely with respect to Your use of the Firestore Linkage.

A. The following definition in Section 1 is modified as follows:

- a. "Hit" means a collection of interactions that results in data being sent to the Service and processed. Examples of Hits may include page view hits and ecommerce hits. A Hit can be a call to the Service by various libraries, but does not have to be so (e.g., a Hit can be delivered to the Service by other Google Analytics-supported protocols and mechanisms made available by the Service to You). For the sake of clarity, a Hit does not include certain events whose collection reflects interactions with certain Properties capable of supporting multiple data streams, and which may include screen views and custom events (the collection of events an "**Enhanced Packet**")

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within or to any other entity or personnel according to permissions set in  
Firebase and (ii) that Property may have certain Service settings modified by  
authorized personnel of Firebase (notwithstanding the settings You may have  
designated for that Property within the Service).

Last Updated June 17, 2019

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Service, last updated May 15,  
2023, downloaded on March 28,  
2024, available at [https://  
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# Google Analytics Terms of Service

These Google Analytics Terms of Service (this "**Agreement**") are entered into by Google LLC ("**Google**") and the entity executing this Agreement ("**You**"). This Agreement governs Your use of the standard Google Analytics (the "**Service**"). BY CLICKING THE "I ACCEPT" BUTTON, COMPLETING THE REGISTRATION PROCESS, OR USING THE SERVICE, YOU ACKNOWLEDGE THAT YOU HAVE REVIEWED AND ACCEPT THIS AGREEMENT AND ARE AUTHORIZED TO ACT ON BEHALF OF, AND BIND TO THIS AGREEMENT, THE OWNER OF THIS ACCOUNT.

**Our Service is a business tool. You must only use our Service exclusively for purposes relating to your trade, business, craft or profession.**

In consideration of the parties' respective rights and obligations that are described in this Agreement, the parties agree as follows:

## 1. Definitions.

**"Account"** refers to the account for the Service and UA Properties and GA4 Properties. For UA Properties, all Views (as applicable) associated with a single UA Property will have their Hits aggregated before determining the charge for the Service for that UA Property.

**"Confidential Information"** includes any proprietary data and any other information disclosed by one party to the other in writing and marked "confidential" or disclosed orally and, within five business days, reduced to writing and marked "confidential". However, Confidential Information will not include any information that is or becomes known to the general public, which is already in the receiving party's possession prior to disclosure by a party or which is independently developed by the receiving party without the use of Confidential Information.

**"Customer Data"** or "Google Analytics Data" means the data that you collect, process or store using the Service concerning the characteristics and activities of Users.

**"Documentation"** means any accompanying documentation made available to You by Google for use with the Processing Software, including any documentation available

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GA4 Property, which may include but is not limited to a page view, transaction, screen view or other interactions. An Event can be a call to the Service from various libraries or otherwise delivered to the Service by OSCIs.

**“GA Property”** means a UA Property or GA4 Property, as applicable.

**“GA4 Property”** (formerly known as an ‘App + Web’ property) means the compilation of Google Analytics settings and information associated with the same ‘Property ID’ to which Events are sent.

**“GAMC”** means the Google Analytics Measurement Code, which is installed on a Property for the purpose of collecting Customer Data, together with any fixes, updates and upgrades provided to You.

**“Google Affiliates”** means Google and its wholly owned subsidiaries.

**“Hit”** means a base unit of measurement that is sent to the Service for processing through a UA Property. Examples of Hits may include page view hits and ecommerce hits. A Hit can be a call to the Service by various libraries or otherwise delivered to the Service by OSCIs.

**“OSCI”** means an **“Officially Supported Client Interface”**, which is a mechanism or protocol made available by or supported by Google that can be used to send Hits or Events, as applicable, to the Service.

**“Platform Home”** means the user interface through which You can access certain Google Marketing Platform-level functionality.

**“Processing Software”** means the Google Analytics server-side software and any upgrades, which analyzes the Customer Data and generates the Reports.

**“Property”** means any web page, application, other property or resource under Your control that sends data to Google Analytics.

**“Privacy Policy”** means the privacy policy on a Property.

**“Report”** means the resulting analysis shown at [analytics.google.com](https://analytics.google.com), some of which may include analysis for a View or Events.

**“SDKs”** mean certain software development kits, which may be used or incorporated into a Property app for the purpose of collecting Customer Data, together with any fixes, updates, and upgrades provided to You.

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**"Software"** means the Processing Software, GAMC and/or SDKs.

**"Third Party"** means any third party (i) to which You provide access to Your Account or (ii) for which You use the Service to collect information on the third party's behalf.

**"UA Property"** means a **"Universal Analytics Property"**, which is the compilation of Google Analytics settings and information associated with the same 'Property ID' to which Hits are sent.

**"Users"** means users and/or visitors to Your Properties.

**"View"** means the collection of settings that together determine the information to be included in, or excluded from, Reports for UA Properties. For example, a View could be established to view a small portion of a web site as a unique Report.

The words **"include"** and **"including"** mean "including but not limited to".

## 2. Fees and Service.

Subject to Section 15, the Service is provided without charge to You for (a) GA4 Properties and (b) UA Properties for up to 10 million Hits per UA Property per month. Google may change its fees and payment policies for the Service from time to time including the addition of costs for geographic data, the importing of cost data from search engines, or other fees charged to Google or another Google Affiliate by third party vendors for the inclusion of data in the Service reports. The changes to the fees or payment policies are effective upon Your acceptance of those changes which will be posted at [www.google.com/analytics/](https://www.google.com/analytics/). Unless otherwise stated, all fees are quoted in U.S. Dollars. Any outstanding balance becomes immediately due and payable upon termination of this Agreement and any collection expenses (including legal fees) incurred by Google will be included in the amount owed, and may be charged to the credit card or other billing mechanism associated with Your Google Ads account.

## 3. Member Account, Password, and Security.

To register for the Service, You must complete the registration process by providing Google with current, complete and accurate information as prompted by the registration form, including Your e-mail address (username) and password. You will protect Your passwords and take full responsibility for Your own, and third party, use of Your accounts. You are solely responsible for any and all activities that occur under

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or any other breach of security. Google Affiliates' support staff may, from time to time, log in to the Service under Your customer password in order to maintain the service, including to provide You assistance with technical or billing issues.

### 4. Nonexclusive License.

Subject to the terms and conditions of this Agreement, (a) Google grants You a limited, revocable, non-exclusive, non-sublicensable license to install, copy and use the GAMC and/or SDKs solely as necessary for You to use the Service on Your Properties or Third Party Properties; and (b) You may remotely access, view and download Your Reports stored at [www.google.com/analytics/](http://www.google.com/analytics/). You will not (and You will not allow any third party to) (i) copy, modify, adapt, translate or otherwise create derivative works of the Software or the Documentation; (ii) reverse engineer, decompile, disassemble or otherwise attempt to discover the source code of the Software, except as expressly permitted by the law in effect in the jurisdiction in which You are located; (iii) rent, lease, sell, assign or otherwise transfer rights in or to the Software, the Documentation or the Service; (iv) remove any proprietary notices or labels on the Software or placed by the Service; (v) use, post, transmit or introduce any device, software or routine which interferes or attempts to interfere with the operation of the Service or the Software; or (vi) use data labeled as belonging to a third party in the Service for purposes other than generating, viewing, and downloading Reports. You will comply with all applicable laws and regulations in Your use of and access to the Documentation, Software, Service and Reports.

### 5. Confidentiality and Beta Features.

Neither party will use or disclose the other party's Confidential Information without the other's prior written consent except for the purpose of performing its obligations under this Agreement or if required by law, regulation or court order; in which case, the party being compelled to disclose Confidential Information will give the other party as much notice as is reasonably practicable prior to disclosing the Confidential Information. Certain Service features are identified as "Alpha," "Beta," "Experiment," (either within the Service or elsewhere by Google) or as otherwise unsupported or confidential (collectively, "Beta Features"). You may not disclose any information from Beta Features or the terms or existence of any non-public Beta Features. Google and the Google Affiliates will have no liability (including any indemnification obligations) arising out of or related to any Beta Features. Any use of Beta Features will be solely at

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sole discretion, cease providing Beta Features as part of any Services.

### 6. Information Rights and Publicity.

Google will not share Your Customer Data or any Third Party's Customer Data with any third parties unless Google (i) has Your consent for any Customer Data or any Third Party's consent for the Third Party's Customer Data; (ii) concludes that it is required by law or has a good faith belief that access, preservation or disclosure of Customer Data is reasonably necessary to protect the rights, property or safety of Google, its users or the public; or (iii) provides Customer Data in certain limited circumstances to third parties to carry out tasks on Google's behalf (e.g., billing or data storage) with strict restrictions that prevent the data from being used or shared except as directed by Google. When this is done, it is subject to agreements that oblige those parties to process Customer Data only on Google's instructions and in compliance with this Agreement and appropriate confidentiality and security measures.

### 7. Privacy.

You will not and will not assist or permit any third party to pass information, hashed or otherwise, to Google that Google could use or recognize as personally identifiable information, except where permitted by, and subject to, the policies or terms of Google Analytics features made available to You, and only if, any information passed to Google for such Google Analytics feature is hashed using industry standards. You will have and abide by an appropriate Privacy Policy and will comply with all applicable laws, policies, and regulations relating to the collection of information from Users. You must post a Privacy Policy and that Privacy Policy must provide notice of Your use of cookies, identifiers for mobile devices (e.g., Android Advertising Identifier or Advertising Identifier for iOS) or similar technology used to collect data. You must disclose the use of Google Analytics, and how it collects and processes data. This can be done by displaying a prominent link to the site "How Google uses information from sites or apps that use our services", (located at [www.google.com/policies/privacy/partners/](https://www.google.com/policies/privacy/partners/), or any other URL that Google may provide from time to time). You will use commercially reasonable efforts to ensure that a User is provided with clear and comprehensive information about, and consents to, the storing and accessing of cookies or other information on the User's device where such activity occurs in connection with the Service and where providing such information and obtaining such consent is required by law.

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If You use the Platform Home, Your use of the Platform Home is subject to the Platform Home Additional Terms (or as subsequently re-named) available at <https://support.google.com/marketingplatform/answer/9047313> (or such other URL as Google may provide) as modified from time to time (the "Platform Home Terms").

To the extent that Your use of the Service is within scope, You and Google agree to the Google Ads Data Processing Terms at <https://business.safety.google/adsprocessorterms/> (the "Processing Terms"). Google will not modify the Processing Terms, except as expressly permitted under the Processing Terms.

## 8. Indemnification.

To the extent permitted by applicable law, You will indemnify, hold harmless and defend Google Affiliates, at Your expense, against (a) any and all third-party claims, actions, proceedings, and suits brought against any Google Affiliate or any of their officers, directors, employees, agents or affiliates, and (b) all related liabilities, damages, settlements, penalties, fines, costs or expenses (including, reasonable attorneys' fees and other litigation expenses) incurred by any Google Affiliate or any of their officers, directors, employees, agents or affiliates, arising out of or relating to such third-party claims, actions, proceedings, and suits; in each case as a result of (i) Your breach of any term or condition of this Agreement, (ii) Your use of the Service, (iii) Your violations of applicable laws, rules or regulations in connection with the Service, (iv) any representations and warranties made by You concerning any aspect of the Service, the Software or Reports to any Third Party; (v) any claims made by or on behalf of any Third Party pertaining directly or indirectly to Your use of the Service, the Software or Reports; (vi) violations of Your obligations of privacy to any Third Party; and/or (vii) any claims with respect to acts or omissions of any Third Party in connection with the Service, the Software or Reports. Google will provide You with written notice of any

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the right, at its own expense, to enforce this Section 8 on behalf of all Google Affiliates and assume the exclusive defense and control of any matter subject to indemnification by You.

### 9. Third Parties.

If You use the Service on behalf of the Third Party or a Third Party otherwise uses the Service through Your Account, whether or not You are authorized by Google to do so, then You represent and warrant that (a) You are authorized to act on behalf of, and bind to this Agreement, the Third Party to all obligations that You have under this Agreement, (b) Google may share with the Third Party any Customer Data that is specific to the Third Party Properties, and (c) You will not disclose Third Party's Customer Data to any other party without the Third Party's consent.

### 10. DISCLAIMER OF WARRANTIES.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, EXCEPT AS EXPRESSLY PROVIDED FOR IN THIS AGREEMENT, GOOGLE MAKES NO OTHER WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR USE AND NONINFRINGEMENT.

### 11. LIMITATION OF LIABILITY.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, GOOGLE WILL NOT BE LIABLE FOR YOUR LOST REVENUES OR INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE DAMAGES, EVEN IF GOOGLE OR ITS SUBSIDIARIES AND AFFILIATES HAVE BEEN ADVISED OF, KNEW OR SHOULD HAVE KNOWN THAT SUCH DAMAGES WERE POSSIBLE AND EVEN IF DIRECT DAMAGES DO NOT SATISFY A REMEDY. GOOGLE'S (AND ITS WHOLLY OWNED SUBSIDIARIES') TOTAL CUMULATIVE LIABILITY TO YOU OR ANY OTHER PARTY FOR ANY LOSS OR DAMAGES RESULTING FROM CLAIMS, DEMANDS, OR ACTIONS ARISING OUT OF OR RELATING TO THIS AGREEMENT WILL NOT EXCEED \$500 (USD).

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## 13. U.S. Government Rights.

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## 14. Term and Termination.



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the Service. Additionally, if Your Account and/or GA Properties are terminated, You will (i) delete all copies of the GAMC from all Properties and/or (ii) suspend any and all use of the SDKs within 3 business days of such termination. In the event of any termination (a) You will not be entitled to any refunds of any usage fees or any other fees, and (b) any outstanding balance for Service rendered through the date of termination will be immediately due and payable in full and (c) all of Your historical Report data will no longer be available to You.

## 15. Modifications to Terms of Service and Other Policies.

Google may modify these terms or any additional terms that apply to the Service to, for example, reflect changes to the law or changes to the Service. You should look at the terms regularly. Google will post notice of modifications to these terms at <https://www.google.com/analytics/terms/>, the Google Analytics Policies at [www.google.com/analytics/policies/](http://www.google.com/analytics/policies/), or other policies referenced in these terms at the applicable URL for such policies. Changes will not apply retroactively and will become effective no sooner than 14 days after they are posted. If You do not agree to the modified terms for the Service, You should discontinue Your use of Google Analytics. No amendment to or modification of this Agreement will be binding unless (i) in writing and signed by a duly authorized representative of Google, (ii) You accept updated terms online, or (iii) You continue to use the Service after Google has posted updates to the Agreement or to any policy governing the Service.

## 16. Miscellaneous, Applicable Law and Venue.

(a) Google will be excused from performance in this Agreement to the extent that performance is prevented, delayed or obstructed by causes beyond its reasonable control. (b) This Agreement (including any amendment agreed upon by the parties in writing) represents the complete agreement between You and Google concerning its subject matter, and supersedes all prior agreements and representations between the parties. (c) If any provision of this Agreement is held to be unenforceable for any reason, such provision will be reformed to the extent necessary to make it enforceable to the maximum extent permissible so as to effect the intent of the parties, and the remainder of this Agreement will continue in full force and effect. (d) This Agreement will be governed by and construed under the laws of the state of California without reference to its conflict of law principles. In the event of any conflicts between foreign

## Marketing Platform

exclusive and personal jurisdiction of the courts located in Santa Clara County, California. The United Nations Convention on Contracts for the International Sale of Goods and the Uniform Computer Information Transactions Act do not apply to this Agreement. You will comply with all applicable export control and sanctions laws and regulations, including (i) the Export Administration Regulations ("EAR") maintained by the U.S. Department of Commerce, (ii) trade and economic sanctions maintained by the U.S. Treasury Department's Office of Foreign Assets Control, and (iii) the International Traffic in Arms Regulations ("ITAR") maintained by the U.S. Department of State. (f) Any notices to Google must be sent to: Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA, with a copy to Legal Department, via first class or air mail or overnight courier, and are deemed given upon receipt. (g) A waiver of any default is not a waiver of any subsequent default. (h) You may not assign or otherwise transfer any of Your rights in this Agreement without Google's prior written consent, and any such attempt is void. (i) The relationship between Google and You is not one of a legal partnership relationship, but is one of independent contractors. (j) This Agreement will be binding upon and inure to the benefit of the respective successors and assigns of the parties hereto. (k) The following sections of this Agreement will survive any termination thereof: 1, 4, 5, 6 (except the last two sentences), 7, 8, 9, 10, 11, 12, 14, 16, and 17.

## 17. Google Analytics and Firebase.

If You link a GA Property to Firebase ("**Firestore Linkage**") as part of using the Service, the following terms, in addition to Sections 1-16 above, will also apply to You, and will also govern Your use of the Service, including with respect to Your use of Firestore Linkage. Other than as modified below, all other terms will stay the same and continue to apply. In the event of a conflict between this Section 17 and Sections 1-16 above, the terms in Section 17 will govern and control solely with respect to Your use of the Firestore Linkage.

The following sentence is added to the end of Section 7 as follows:

If You link a GA Property to a Firestore project ("**Firestore Linkage**") (i) certain data from Your GA Property, including Customer Data, may be made accessible within or to any other entity or personnel specified in the applicable Firestore settings and (ii) that GA Property may have certain Service settings modified by authorized personnel specified in the applicable Firestore settings (notwithstanding the settings You may have designated for that GA Property within the Service).

Last Updated May 15, 2023

3/28/24, 2:22 PM

Terms of Service | Google Analytics – Google

## Marketing Platform

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# Appendix A-3

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**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA**

ANIBAL RODRIGUEZ, SAL CATALDO,  
JULIAN SANTIAGO, and SUSAN LYNN  
HARVEY individually and on behalf of all  
other similarly situated,

Plaintiffs,

v.

GOOGLE LLC,

Defendant.

Case No.: 3:20-cv-04688-RS

**DECLARATION OF SAL CATALDO IN  
SUPPORT OF PLAINTIFFS' MOTION  
FOR CLASS CERTIFICATION**

Judge: Hon. Richard Seeborg  
Courtroom 3 – 17th Floor  
Date: October 5, 2023  
Time: 1:30 p.m.

**DECLARATION OF SAL CATALDO**

I, Sal Cataldo, declare as follows.

1. My name is Sal Cataldo. I am over eighteen years of age and am competent to testify to and have personal knowledge of the facts set forth herein.

2. I am a plaintiff in this lawsuit against Google, LLC (“Google”). Because I am very privacy minded and continually explore the options to control whether and how my data is used, I discovered Google’s Web & App Activity (“WAA”) and Supplemental Web & App Activity (“sWAA”) privacy controls and used them to block Google from tracking me. Because Google is one of the largest tech companies on the planet, I turned WAA and sWAA off so that it could not collect, save, or use any of my Web & App Activity and supplemental Web & App Activity.

3. I recall opening my main Google account in 2005, and years before this lawsuit was filed, I had read Google’s Terms of Service, Privacy Policy, and other Google disclosures so that I knew what data Google did and did not collect when WAA and sWAA were turned off. I agreed to those terms. This included the Activity Controls screen, which included the WAA and sWAA options that Google offered as ways to stop Google from collecting, saving, and using my Web & App Activity and supplemental Web & App Activity when WAA and sWAA were turned off. All of these documents and disclosures from Google reiterated that I was in control of what information would and would not be shared with Google, and that when I turned off WAA and sWAA that Google would not have any access to my Web & App Activity and supplemental Web & App Activity.

4. Although I had turned off WAA and sWAA and thought Google was not collecting, storing, or using my Web & App Activity and supplemental Web & App Activity, I learned about this lawsuit and I went back to check my WAA and sWAA settings and was surprised to learn that even though I vividly recalled turning WAA and sWAA off, those settings had been re-enabled. So I sought the advice of the attorneys in this case and decided to join the lawsuit to pursue Google for the privacy violations that it was engaging in.

# Appendix A-4

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**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA**

ANIBAL RODRIGUEZ, SAL CATALDO,  
JULIAN SANTIAGO, and SUSAN LYNN  
HARVEY individually and on behalf of all  
other similarly situated,

Plaintiffs,

v.

GOOGLE LLC,

Defendant.

Case No.: 3:20-cv-04688-RS

**DECLARATION OF SUSAN HARVEY  
IN SUPPORT OF PLAINTIFFS'  
MOTION FOR CLASS CERTIFICATION**

Judge: Hon. Richard Seeborg  
Courtroom 3 – 17th Floor  
Date: October 5, 2023  
Time: 1:30 p.m.



**DECLARATION OF SUSAN HARVEY**

I, Susan Harvey, declare as follows.

1. My name is Susan Harvey. I am over eighteen years of age and am competent to testify to and have personal knowledge of the facts set forth herein.

2. I am a plaintiff in this lawsuit against Google, LLC (“Google”). To protect my privacy, I use Google’s Web & App Activity (“WAA”) and Supplemental Web & App Activity (“sWAA”) privacy controls to block Google from tracking me. I was the victim of identity theft when my Google account was accessed and fraudulent charges were made with the Google Play store, so I wanted to make sure that my Web & App Activity and supplemental Web & App Activity was not being stored anywhere. Because Google is a tech behemoth and collects enormous amounts of data and it’s not clear to me what Google does or doesn’t do with it afterward, I turned WAA and sWAA off so that it could not collect, save, or use any of my Web & App Activity and supplemental Web & App Activity.

3. When I opened my main Google account in 2009, and years before this lawsuit was filed, I carefully read Google’s Terms of Service, Privacy Policy, and other Google disclosures to understand what information was and was not collected if I chose to turn off WAA and sWAA. I agreed to those terms. This included Google’s Activity Controls screen, which included the WAA and sWAA options that Google said are ways to prevent Google from collecting, saving, and using my Web & App Activity and supplemental Web & App Activity when I turned off WAA and sWAA. These documents and disclosures offered me control of what Google did or did not collect, and that when I turned off WAA and sWAA, Google would not have any access whatsoever to my Web & App Activity and supplemental Web & App Activity.

4. Although I had turned off WAA and sWAA and thought Google was not collecting, storing, or using my Web & App Activity and supplemental Web & App Activity, I remember reading about this new lawsuit and it caught my attention because of the past problems I had with my Google account and how I specifically did not want Google collecting, saving, or using my

# Appendix A-5

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**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA**

ANIBAL RODRIGUEZ, SAL CATALDO,  
JULIAN SANTIAGO, and SUSAN LYNN  
HARVEY individually and on behalf of all  
other similarly situated,

Plaintiffs,

v.

GOOGLE LLC,

Defendant.

Case No.: 3:20-cv-04688-RS

**DECLARATION OF ANIBAL  
RODRIGUEZ IN SUPPORT OF  
PLAINTIFFS' MOTION FOR CLASS  
CERTIFICATION**

Judge: Hon. Richard Seeborg  
Courtroom 3 – 17th Floor  
Date: October 5, 2023  
Time: 1:30 p.m.

**DECLARATION OF ANIBAL RODRIGUEZ**

I, Anibal Rodriguez, declare as follows.

1. My name is Anibal Rodriguez. I am over eighteen years of age and am competent to testify to and have personal knowledge of the facts set forth herein.

2. I am a plaintiff in this lawsuit against Google, LLC (“Google”). To protect my privacy, I use Google’s Web & App Activity (“WAA”) and Supplemental Web & App Activity (“sWAA”) privacy controls to block Google from tracking me. Because Google is a one of if not the largest companies that collects comprehensive data on people, I turned WAA and sWAA off to prevent Google from collecting information about me and using it to track me.

3. When I opened my Google account in 2014, and in the years before filing this lawsuit, I had read Google’s Terms of Service, Privacy Policy, and other Google disclosures to understand what data was and was not collected when WAA and sWAA were turned off. I agreed to those terms. This included the Activity Controls page, and Google was never mentioned as someone that would still have access to my Web & App Activity and supplemental Web & App Activity when WAA and sWAA were turned off. All of these documents and disclosures from Google provided me with the option to control of what information would be shared with Google and when, and I expected that Google would not collect, save, or use my Web & App Activity and supplemental Web & App Activity when I had turned off WAA and sWAA.

4. After learning about privacy concerns stemming from Google’s data collection, I sought the advice of an expert and attorneys to further investigate those patterns. Then I found out that Google’s representations and disclosures about WAA and sWAA were false and that Google instead collects massive amounts of data from my phone even when WAA and sWAA are turned off. So, I filed this lawsuit to pursue Google for this conduct and to protect my privacy and the privacy of those who turned off WAA and sWAA.

5. I brought this case as a class action on behalf of two nationwide classes of individuals. The first nationwide class is:

# Appendix A-6

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v.

GOOGLE LLC,

Defendant.

Case No.: 3:20-cv-04688-RS

**DECLARATION OF JULIAN  
SANTIAGO SUPPORT OF PLAINTIFFS'  
MOTION FOR CLASS CERTIFICATION**

Judge: Hon. Richard Seeborg  
Courtroom 3 – 17th Floor  
Date: October 5, 2023  
Time: 1:30 p.m.

**DECLARATION OF JULIAN SANTIAGO**

I, Julian Santiago, declare as follows.

1. My name is Julian Santiago. I am over eighteen years of age and am competent to testify to and have personal knowledge of the facts set forth herein.

2. I am a plaintiff in this lawsuit against Google, LLC (“Google”). Because I should be in control of what is or is not collected, I use Google’s Web & App Activity (“WAA”) and Supplemental Web & App Activity (“sWAA”) privacy controls to block Google from tracking me. Because Google is a large company that collects massive amounts of data, I turned WAA and sWAA off so that it could not collect, save, or use any of my data.

3. I opened my personal Google account around 2016 and my work Google account around 2020, and in the years before this lawsuit was filed, I recall reading Google’s Terms of Service, Privacy Policy, and other Google disclosures so that I could understand what data Google did and did not collect when WAA and sWAA were turned off. I agreed to those terms. This included the Activity Controls page, which did not include Google as someone who would still have access to my Web & App Activity and supplemental Web & App Activity when WAA and sWAA were turned off. All of these documents and disclosures from Google gave me the option to control what information would be shared with Google and when, and I expected that Google would not collect, save, or use my Web & App Activity and supplemental Web & App Activity when I had turned off WAA and sWAA.

4. Although I had turned off WAA and sWAA and thought Google was not collecting, storing, or using my Web & App Activity and supplemental Web & App Activity, when I read about this lawsuit, it led me to question whether that was true, so I contacted my current counsel to learn more about what was going on and to join the case.

5. I joined this lawsuit with the understanding that the case has been brought as a class action on behalf of two nationwide classes of individuals. The first nationwide class is:

Class 1: All individuals who, during the period beginning July 1, 2016 and continuing through the present (the “Class Period”), (a) had their “Web & App Activity” and/or “supplemental Web & App Activity” setting turned off and (b) whose activity on a non-

# Appendix A-7



## PRIVACY POLICY

Last modified: June 28, 2016 ([view archived versions](#))

There are many different ways you can use our services – to search for and share information, to communicate with other people or to create new content. When you share information with us, for example by creating a [Google Account](#), we can make those services even better – to show you more relevant search results and ads, to help you [connect with people](#) or to make [sharing with others quicker and easier](#). As you use our services, we want you to be clear how we’re using information and the ways in which you can protect your privacy.

Our Privacy Policy explains:

- What information we collect and why we collect it.
- How we use that information.
- The choices we offer, including how to access and update information.

We’ve tried to keep it as simple as possible, but if you’re not familiar with terms like cookies, IP addresses, pixel tags and browsers, then read about these [key terms](#) first.

Your privacy matters to Google so whether you are new to Google or a long-time user, please do take the time to get to know our practices – and if you have any questions [contact us](#).

## Information we collect

We collect information to provide better services to all of our users – from figuring out basic stuff like which language you speak, to more complex things like [ads you'll find most useful](#), [the people who matter most to you online](#), or which YouTube videos you might like.

We collect information in the following ways:

- **Information you give us.** For example, many of our services require you to sign up for a Google Account. When you do, we'll ask for [personal information](#), like your name, email address, telephone number or [credit card](#) to store with your account. If you want to take full advantage of the sharing features we offer, we might also ask you to create a publicly visible [Google Profile](#), which may include your name and photo.
- **Information we get from your use of our services.** We [collect information](#) about the services that you use and how you use them, like when you watch a video on YouTube, visit a website that uses our advertising services, or [view and interact with our ads](#) and content. This information includes:
  - [Device information](#)

We collect device-specific information (such as your hardware model, operating system version, unique device identifiers, and mobile network information including phone number). Google may associate your device identifiers or phone number with your Google Account.

- **Log information**

When you use our services or view content provided by Google, we automatically collect and store certain information in [server logs](#). This includes:

- details of how you used our service, such as your search queries.
- telephony log information like your phone number, calling-party number, forwarding numbers, time and date of calls, duration of calls, SMS routing information and types of calls.
- [Internet protocol address](#).
- device event information such as crashes, system activity, hardware settings, browser type, browser language, the date and time of your request and referral URL.
- cookies that may uniquely identify your browser or your Google Account.

- **Location information**

When you use Google services, we may collect and process information about your actual location. We use various technologies to determine location, including IP address, GPS, and other sensors that may, for example, provide Google with information on nearby devices, Wi-Fi access points and cell towers.

- **Unique application numbers**

Certain services include a unique application number. This number and information about your installation (for example, the operating system type and application version number) may be sent to Google when you install or uninstall that service or when that service periodically contacts our servers, such as for automatic updates.

- **Local storage**

We may collect and store information (including personal information) locally on your device using mechanisms such as browser web storage (including HTML 5) and application data caches.

- **Cookies and similar technologies**

We and our partners use various technologies to collect and store information when you visit a Google service, and this may include using cookies or similar technologies to identify your browser or device. We also

use these technologies to collect and store information when you interact with services we offer to our partners, such as advertising services or Google features that may appear on other sites. Our Google Analytics product helps businesses and site owners analyze the traffic to their websites and apps. When used in conjunction with our advertising services, such as those using the DoubleClick cookie, Google Analytics information is linked, by the Google Analytics customer or by Google, using Google technology, with information about visits to multiple sites.

Information we collect when you are signed in to Google, in addition to information we obtain about you from partners, may be associated with your Google Account. When information is associated with your Google Account, we treat it as personal information. For more information about how you can access, manage or delete information that is associated with your Google Account, visit the [Transparency and choice](#) section of this [policy](#).

## How we use information we collect

We use the information we collect from all of our services to [provide, maintain, protect](#) and improve them, to [develop new ones](#), and to [protect Google and our users](#). We also use this information to offer you tailored content – like giving you more relevant search results and ads.

We may use the name you provide for your Google Profile across all of the services we offer that require a Google Account. In addition, we may replace past names associated with your Google Account so that you are represented consistently across all our services. If other users already have your email, or other information that identifies you,

Case 3:20-cv-04688-RS Document 323-1 Filed 08/24/23 Page 8 of 67

we may show them your publicly visible Google Profile information, such as your name and photo.

If you have a Google Account, we may display your Profile name, Profile photo, and actions you take on Google or on third-party applications connected to your Google Account (such as +1's, reviews you write and comments you post) in our services, including displaying in ads and other commercial contexts. We will respect the choices you make to [limit sharing or visibility settings](#) in your Google Account.

When you contact Google, we keep a record of your communication to help solve any issues you might be facing. We may use your email address to inform you about our services, such as letting you know about upcoming changes or improvements.

We use information collected from cookies and other technologies, like [pixel tags](#), to [improve your user experience](#) and the overall quality of our services. One of the products we use to do this on our own services is Google Analytics. For example, by saving your language preferences, we'll be able to have our services appear in the language you prefer. When showing you tailored ads, we will not associate an identifier from cookies or similar technologies with [sensitive categories](#), such as those based on race, religion, sexual orientation or health.

Our automated systems analyze your content (including emails) to provide you personally relevant product features, such as customized search results, tailored advertising, and spam and malware detection.

[We may combine personal information from one service with information, including personal information, from other Google services – for example to make it easier to share things with people you know.](#) Depending on your account settings, your activity on

Case 3:20-cv-04688-RS Document 323-1 Filed 08/24/23 Page 9 of 67

other sites and apps may be associated with your personal information in order to improve Google's services and the ads delivered by Google.

We will ask for your consent before using information for a purpose other than those that are set out in this Privacy Policy.

Google processes personal information on our servers in many countries around the world. We may process your personal information on a server located outside the country where you live.

## Transparency and choice

People have different privacy concerns. Our goal is to be clear about what information we collect, so that you can make meaningful choices about how it is used. For example, you can:

- [Review and update your Google activity controls](#) to decide what types of data, such as videos you've watched on YouTube or past searches, you would like saved with your account when you use Google services. You can also visit these [controls](#) to manage whether certain activity is stored in a cookie or similar technology on your device when you use our services while signed-out of your account.
- [Review and control](#) certain types of information tied to your Google Account by using Google Dashboard.
- [View and edit](#) your preferences about the Google ads shown to you on Google and across the web, such as which categories might interest you, using Ads Settings. You can also opt out of certain Google advertising services here.

- Adjust how the Profile associated with your Google Account appears to others.
- Control who you share information with through your Google Account.
- Take [information](#) associated with your Google Account out of many of our services.
- Choose whether your Profile name and Profile photo appear in shared endorsements that appear in ads.

You may also set your browser to block all cookies, including cookies associated with our services, or to indicate when a cookie is being set by us. However, it's important to remember that many of our services [may not function properly](#) if your cookies are disabled. For example, we may not remember your language preferences.

## Information you share

Many of our services let you share information with others. Remember that when you share information publicly, it may be indexable by search engines, including Google. Our services provide you with different options on [sharing](#) and [removing your content](#).

## Accessing and updating your personal information

Whenever you use our services, we aim to provide you with [access to your personal information](#). If that information is wrong, we strive to give you ways to update it quickly



Case 3:20-cv-04688-RS Document 323-1 Filed 08/24/23 Page 11 of 67

or to delete it – unless we have to keep that information for legitimate business or legal purposes. When updating your personal information, we may ask you to verify your identity before we can act on your request.

We may reject requests that are unreasonably repetitive, require disproportionate technical effort (for example, developing a new system or fundamentally changing an existing practice), risk the privacy of others, or would be extremely impractical (for instance, requests concerning information residing on backup systems).

Where we can provide information access and correction, we will do so for free, except where it would require a disproportionate effort. We aim to maintain our services in a manner that protects information from accidental or malicious destruction. Because of this, after you delete information from our services, we may not immediately delete residual copies from our active servers and may not remove information from our backup systems.

## Information we share

We do not share personal information with companies, organizations and individuals outside of Google unless one of the following circumstances applies:

- With your consent

We will share personal information with companies, organizations or individuals outside of Google when we have your consent to do so. We require opt-in consent for the sharing of any [sensitive personal information](#).

- **With domain administrators**

If your Google Account is managed for you by a [domain administrator](#) (for example, for Google Apps users) then your domain administrator and resellers who provide user support to your organization will have access to your Google Account information (including your email and other data). Your domain administrator may be able to:

- view statistics regarding your account, like statistics regarding applications you install.
- change your account password.
- suspend or terminate your account access.
- access or retain information stored as part of your account.
- receive your account information in order to satisfy applicable law, regulation, [legal process or enforceable governmental request](#).
- restrict your ability to delete or edit information or privacy settings.

Please refer to your domain administrator's privacy policy for more information.

- **For external processing**

We provide personal information to our affiliates or other trusted businesses or persons to process it for us, based on our instructions and in compliance with our Privacy Policy and any other appropriate confidentiality and security measures.

- For legal reasons

We will share personal information with companies, organizations or individuals outside of Google if we have a good-faith belief that access, use, preservation or disclosure of the information is reasonably necessary to:

- meet any applicable law, regulation, legal process or enforceable governmental request.
- enforce applicable Terms of Service, including investigation of potential violations.
- detect, prevent, or otherwise address fraud, security or technical issues.
- protect against harm to the rights, property or safety of Google, our users or the public as required or permitted by law.

We may share non-personally identifiable information publicly and with our partners – like publishers, advertisers or connected sites. For example, we may share information publicly to show trends about the general use of our services.

If Google is involved in a merger, acquisition or asset sale, we will continue to ensure the confidentiality of any personal information and give affected users notice before personal information is transferred or becomes subject to a different privacy policy.

## Information security

We work hard to protect Google and our users from unauthorized access to or unauthorized alteration, disclosure or destruction of information we hold. In particular:

- We encrypt many of our services [using SSL](#).
- We offer you [two step verification](#) when you access your Google Account, and a [Safe Browsing feature](#) in Google Chrome.
- We review our information collection, storage and processing practices, including physical security measures, to guard against unauthorized access to systems.
- We restrict access to personal information to Google employees, contractors and agents who need to know that information in order to process it for us, and who are subject to strict contractual confidentiality obligations and may be disciplined or terminated if they fail to meet these obligations.

## When this Privacy Policy applies

Our Privacy Policy applies to all of the services offered by Google Inc. and its affiliates, including YouTube, services Google provides on Android devices, and services offered on other sites (such as our advertising services), but excludes services that have separate privacy policies that do not incorporate this Privacy Policy.

Our Privacy Policy does not apply to services offered by other companies or individuals, including products or sites that may be displayed to you in search results, sites that may include Google services, or other sites linked from our services. Our Privacy Policy does not cover the information practices of other companies and organizations who advertise our services, and who may use cookies, pixel tags and other technologies to serve and offer relevant ads.

## Compliance and cooperation with regulatory authorities

We regularly review our compliance with our Privacy Policy. We also adhere to several [self regulatory frameworks](#). When we receive formal written complaints, we will contact the person who made the complaint to follow up. We work with the appropriate regulatory authorities, including local data protection authorities, to resolve any complaints regarding the transfer of personal data that we cannot resolve with our users directly.

## Changes

Our Privacy Policy may change from time to time. We will not reduce your rights under this Privacy Policy without your explicit consent. We will post any privacy policy changes on this page and, if the changes are significant, we will provide a more prominent notice (including, for certain services, email notification of privacy policy changes). We will also keep prior versions of this Privacy Policy in an archive for your review.

## Specific product practices

The following notices explain specific privacy practices with respect to certain Google products and services that you may use:

- [Chrome and Chrome OS](#)
- [Play Books](#)
- [Payments](#)
- [Fiber](#)
- [Project Fi](#)
- [Google Apps for Education](#)

For more information about some of our most popular services, you can visit the [Google Product Privacy Guide](#).

## Other useful privacy and security related materials

Further useful privacy and security related materials can be found through Google's [policies and principles pages](#), including:

- Information about our technologies and principles, which includes, among other things, more information on
  - [how Google uses cookies](#).
  - technologies we use for advertising.
  - how we [recognize patterns like faces](#).
- A [page](#) that explains what data is shared with Google when you visit websites that use our advertising, analytics and social products.
- The [Privacy Checkup](#) tool, which makes it easy to review your key privacy settings.
- Google's [safety center](#), which provides information on how to stay safe and secure online.

## "access to your personal information"

For example, with Google Dashboard you can quickly and easily see some of the data associated with your Google Account. [Learn more](#).

## "ads you'll find most useful"

For example, if you frequently visit websites and blogs about gardening, you may see ads related to gardening as you browse the web. [Learn more](#).

## **"advertising services"**

For example, if you frequently visit websites and blogs about gardening that show our ads, you may start to see ads related to this interest as you browse the web. [Learn more.](#)

## **"and other sensors"**

Your device may have sensors that provide information to assist in a better understanding of your location. For example, an accelerometer can be used to determine things like speed, or a gyroscope to figure out direction of travel. [Learn more.](#)

## **"collect information"**

This includes information like your usage data and preferences, Gmail messages, G+ profile, photos, videos, browsing history, map searches, docs, or other Google-hosted content. [Learn more.](#)

**"combine personal information from one service with information, including personal information, from other Google services"**



For example, when you're signed in to your Google Account and search on Google, you can see search results from the public web, along with pages, photos, and Google+ posts from your friends and people who know you or follow you on Google+ may see your posts and profile in their results. [Learn more.](#)

## **"connect with people"**

For example, you could get suggestions of people you might know or want to connect with on Google+, based on the connections you have with people on other Google products, like Gmail and people who have a connection with you may see your profile as a suggestion. [Learn more.](#)

## **"credit card"**

Whilst we currently don't ask for a credit card during sign up, verifying your age through a small credit card transaction is one way to confirm that you meet our age requirements in case your account was disabled after you have entered a birthday indicating you are not old enough to have a Google Account. [Learn more.](#)

## **"develop new ones"**

For example, Google's spell checking software was developed by analyzing previous searches where users had corrected their own spelling. [Learn more.](#)

## **"device identifiers"**

Device identifiers let Google know which unique device you are using to access our services, which can be used to customise our service to your device or analyse any device issues related to our services. [Learn more.](#)

## **"device-specific information"**

For example, when you visit Google Play from your desktop, Google can use this information to help you decide on which devices you'd like your purchases to be available for use. [Learn more.](#)

## **"improve your user experience"**

For example, cookies allow us to analyse how users interact with our services. [Learn more.](#)

## **"legal process or enforceable governmental request"**

Like other technology and communications companies, Google regularly receives requests from governments and courts around the world to hand over user data. Our legal team reviews each and every request, regardless of type, and we frequently push back when the requests appear to be overly broad or don't follow the correct process. [Learn more.](#)

## "limit sharing or visibility settings"

For example, you can choose your settings so your name and photo do not appear in an ad. [Learn more.](#)

## "linked with information about visits to multiple sites"

Google Analytics is based on first-party cookies. Data generated through Google Analytics can be linked, by the Google Analytics customer or by Google, using Google technology, to third-party cookies, related to visits to other websites, for instance when an advertiser wants to use its Google Analytics data to create more relevant ads, or to further analyze its traffic. [Learn more.](#)

## "maintain"

For example, we continuously monitor our systems to check that they are working as intended and in order to detect and fix errors. [Learn more.](#)

## **"may collect and process information about your actual location"**

For example, Google Maps can center the maps view on your current location. [Learn more.](#)

## **"may not function properly"**

For example, we use a cookie called 'lbc' which makes it possible for you to open many Google Docs in one browser. [Learn more.](#)

## **"and our partners"**

We allow trusted businesses to use cookies or similar technologies for advertising and research purposes on our services. [Learn more.](#)

## **"phone number"**

For example, if you add a phone number as a recovery option, if you forget your password Google can send you a text message with a code to enable you to reset it. [Learn more.](#)

## "protect Google and our users"

For example, if you're concerned about unauthorized access to your email, "Last account activity" in Gmail shows you information about recent activity in your email, such as the IP addresses that accessed your mail, the associated location, as well as the time and date. [Learn more.](#)

## "protect"

For example, one reason we collect and analyze IP addresses and cookies is to protect our services against automated abuse. [Learn more.](#)

## "provide"

For example, the IP address assigned to your device is used to send the data you requested back to your device. [Learn more.](#)

## **"sharing"**

For example, with Google+, you have many different sharing options. [Learn more.](#)

## **"sharing with others quicker and easier"**

For example, if someone is already a contact, Google will autocomplete their name if you want to add them to a message in Gmail. [Learn more.](#)

## **"the people who matter most to you online"**

For example, when you type an address in the To, Cc, or Bcc field of a message you're composing, Gmail will suggest addresses from your Contacts list. [Learn more.](#)

## **"to make it easier to share things with people you know"**

For example, if you have communicated with someone via Gmail and want to add them to a Google Doc or an event in Google Calendar, Google makes it easy to do so by autocompleting their email address when you start to type in their name. [Learn more.](#)

## "view and interact with our ads"

For example, we regularly report to advertisers on whether we served their ad to a page and whether that ad was likely to be seen by users (as opposed to, for example, being on part of the page to which users did not scroll). [Learn more.](#)

## "We may share aggregated, non-personally identifiable information publicly"

When lots of people start searching for something, it can provide very useful information about particular trends at that time. [Learn more.](#)

## "Wi-Fi access points and cell towers"

For example, Google can approximate your device's location based on the known location of nearby cell towers. [Learn more.](#)

## "more relevant search results"

For example, we can make search more relevant and interesting for you by including photos, posts, and more from you and your friends. [Learn more.](#)

## "removing your content"

For example, you can delete your [Web & App Activity](#), your blog, a Google Site you own, your [YouTube Channel](#), your [Google+](#) profile or your entire Google account. [Learn more.](#)

## "to show trends"

You can see some of these at [Google Trends](#) and [YouTube Trends](#). [Learn more.](#)

## "your activity on other sites and apps"

This activity might come from your use of Google products like Chrome Sync or from your visits to sites and apps that partner with Google. Many websites and apps partner with Google to improve their content and services. For example, a website might use our advertising services (like AdSense) or analytics tools (like Google Analytics). These products share information about your activity with Google and, depending on your account settings and the products in use (for instance, when a partner uses Google



Analytics in conjunction with our advertising services), this data may be associated with your personal information. [Learn more.](#)

*How Google uses your data for ads*

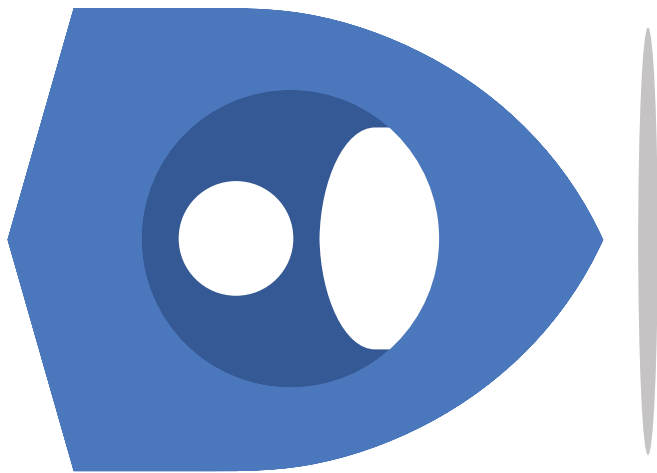
as published on September 26, 2016,  
downloaded on August 23, 2023, available at:

<https://web.archive.org/web/20160926141132/https://privacy.google.com/how-ads-work.html>



Privacy

Menu ▾



How Ads Work

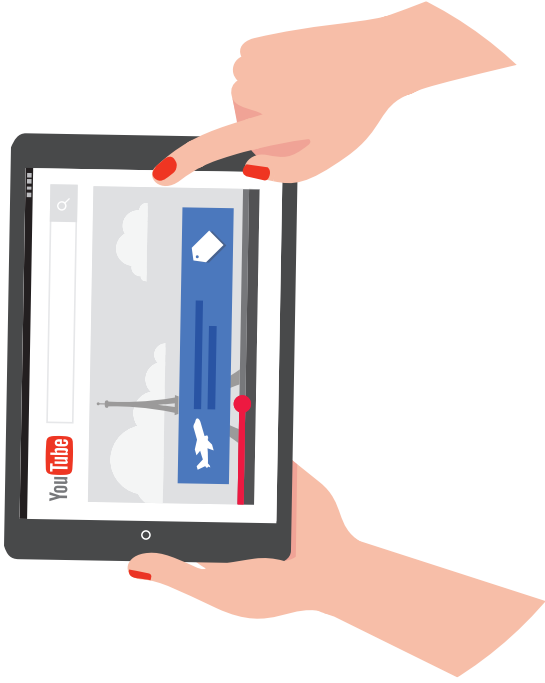
**We do not sell your personal information to anyone.**



## Privacy

Menu ▼

and mobile apps that partner with us. Ads help keep our services free for everyone. We use data to show you these ads, but we do not sell personal information like your name, email address, and payment information.



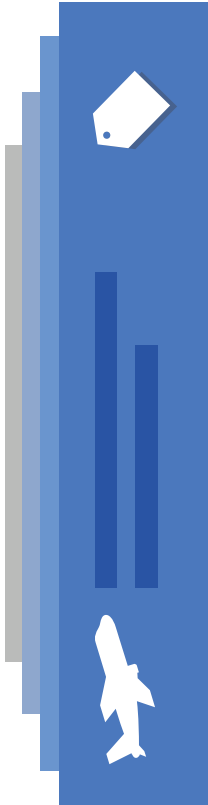
## We use data to make ads relevant

We try to show you useful ads by using data collected from your devices, including your searches and location, websites and apps you have used, videos and ads you have seen, and personal information you have given us, such as your age



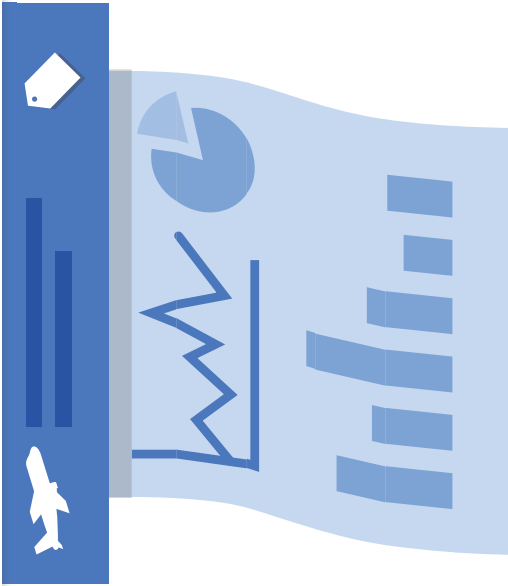
Menu ▼

When you are signed in and using our services, we collect information about you and your device. When you visit a travel website on your computer at work, you might see ads about airfares to Paris on your phone later that night.



## Advertisers pay only for ads that people see or tap

When advertisers run ad campaigns with us, they pay us based only on how those ads actually perform — never on your personal information. That could include each time someone views or taps an ad, or takes an action having seen an ad, like downloading an app or filling out a request form.

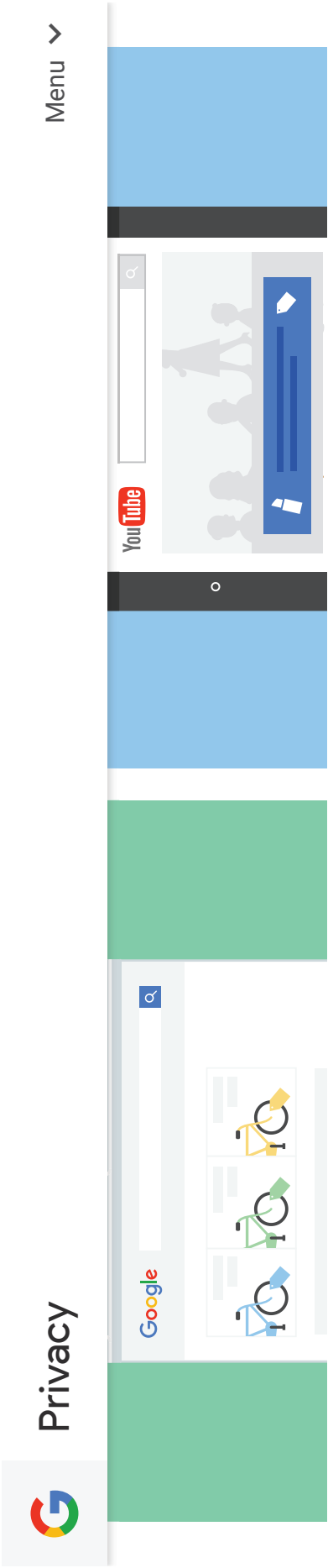


## We show advertisers how well their campaigns worked

We give advertisers data about their ads' performance, but we do so without revealing any of your personal information. At every point in the process of showing you ads, we keep your personal information protected and private.

## How ads work on Google services and partner sites

We use data to show ads that are useful to you, whether they are on Google services or websites and mobile apps that partner with us.

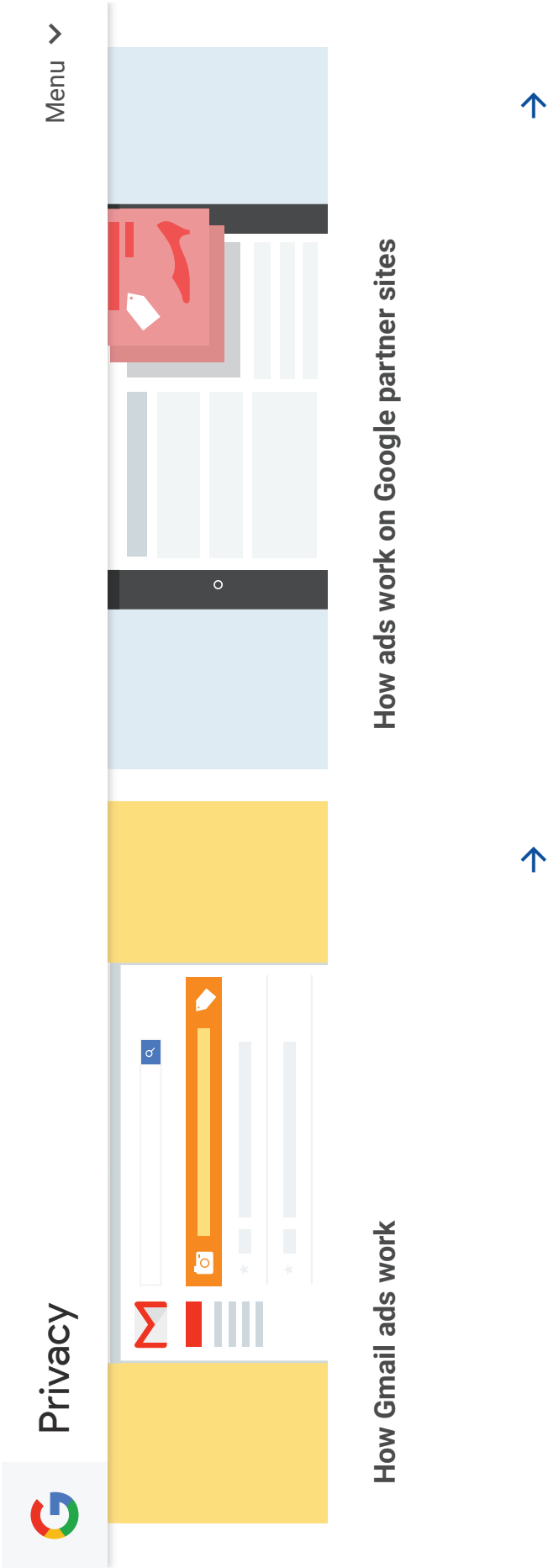


How Search ads work



How YouTube ads work






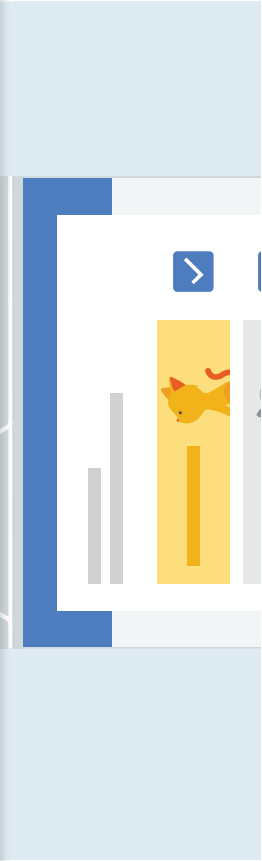
# Take control of your Google ads experience

We give you tools to control the types of ads you see whether you are signed in or signed out.






Privacy



Control ads based on your preferences

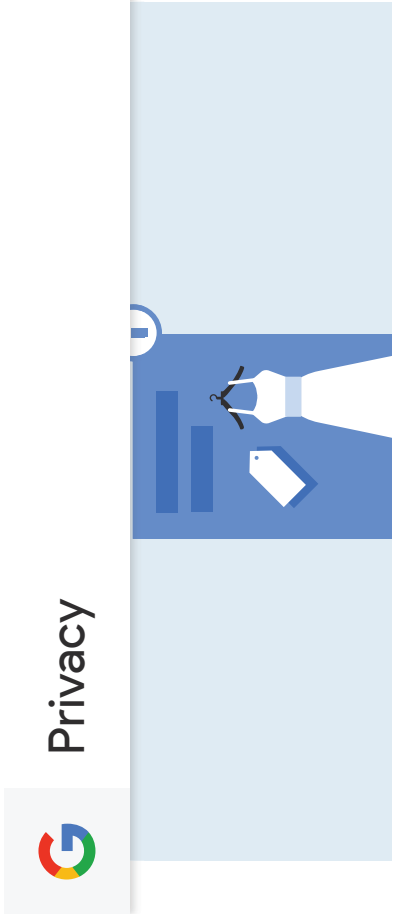


Remove ads you do not want to see

Menu

↑

↑



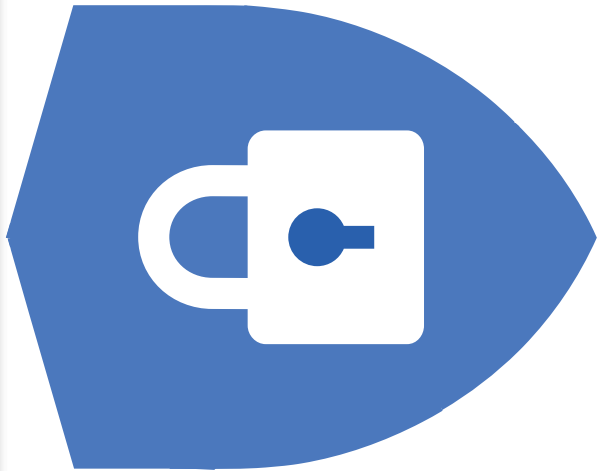
Menu ▾

Learn what data we use to show you ads





Menu ▾



Safer Internet

**We help make the Internet safer  
for everyone.**



## Privacy

Menu ▼

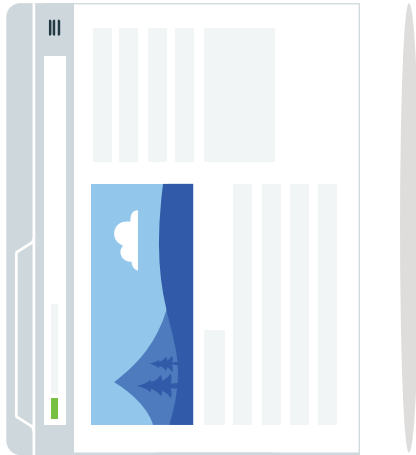
safer, we find opportunities to share it for everyone's benefit. And as threats change over time, our adaptive, forward-looking measures pave the way for other companies to follow.



## Safe Browsing protects more than just Chrome users

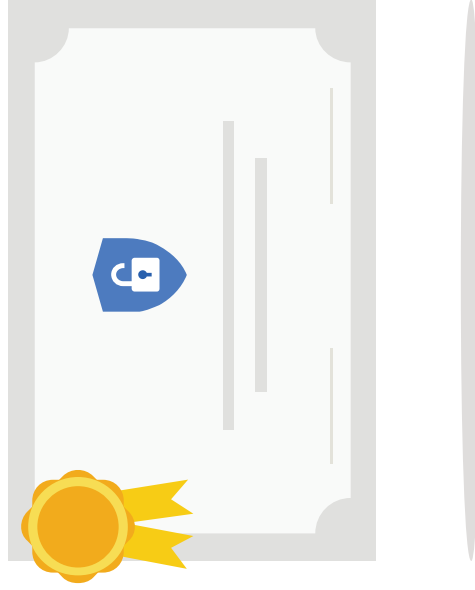
We originally built our [Safe Browsing technology](#) to protect Chrome users from malware and phishing attempts by alerting them when they try to visit dangerous websites. To make the Internet safer for everyone, we made this

We also alert website owners when their sites have security flaws and offer free tools to help them quickly fix the problems. By continuing to share new security technology as we develop it, we help build an Internet that is safer for everyone.



## We use HTTPS to keep you safer while you browse the Internet

Connecting to our services through [HTTPS encryption](#) protects you from prying eyes and malicious hackers to make sure you get only to what and where you want. To motivate websites to adopt this added security, we have made HTTPS



## We create security rewards to uncover vulnerabilities

At Google we create [security rewards programs](#) that pay independent researchers to find vulnerabilities in our services and create security fixes. Every year we award millions of dollars in research grants and bug bounties. We currently use security reward programs for many Google products, like Chrome and Android.



Privacy

Menu ▼



## We make our security tools available to developers

We share our security technology when we believe it can provide value for others. For example, we make our Google Cloud Security Scanner freely available to developers so they can scan and analyze their web applications in App Engine for security vulnerabilities.



## Privacy

Menu ▾



## We share data about our practices to foster a safer Internet

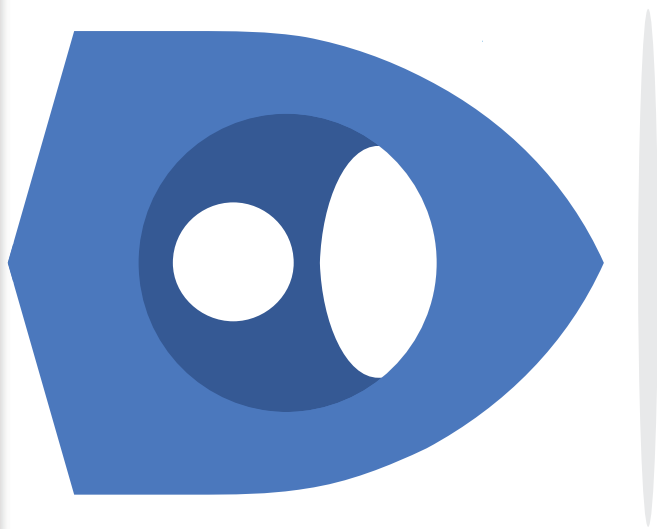
Since 2010 Google has published the [Transparency Report](#), which features statistics on things like copyright removals, government requests for user data, and security initiatives like Safe Browsing. We also share data on the industry's adoption of encryption for websites and email. We do this not only to share our progress with our users, but to encourage others to adopt stronger security standards in the interest of a safer Internet for all.





Privacy

Menu ▾



Your Data

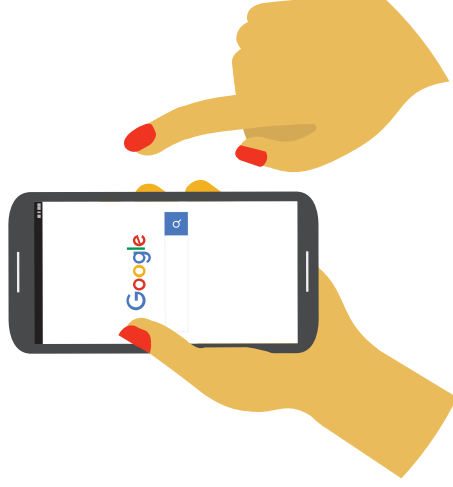
**We want you to understand what data  
we collect and use.**



## Privacy

Menu ▼

Here are the three main types of data we collect:



## Things you do

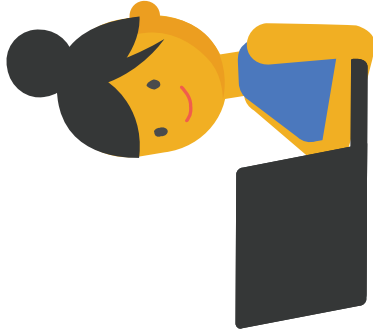
When you use our services — for example, do a search on Google, get directions on Google Maps, or watch a video on YouTube — we collect data to make these services work for you. This can include:

- Things you search for

 **Privacy**

- Ads you click on or tap
- Your location
- Device information
- IP address and cookie data

Menu 



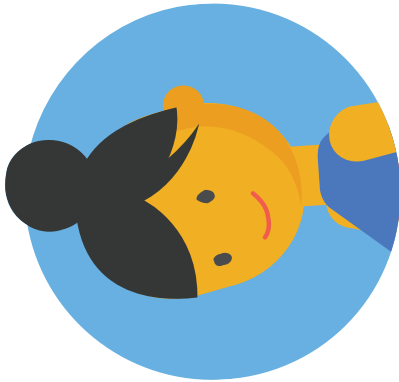
## Things you create

If you are signed in with your Google Account, we store and protect what you create using our services. This can include:



- Calendar events
- Photos and videos you upload
- Docs, Sheets, and Slides on Drive

Menu



## Things that make you “you”

When you sign up for a Google account, we keep the basic information that you give us. This can include your:

- Name



Menu ▾

- Gender
- Phone number
- Country

## How data improves Google services

Here are a few ways we use data to make our services faster, smarter, and more useful to you.



Privacy

Menu 



Privacy

Menu 

# Take control of your Google experience

Here are some tools you can use anytime to manage your privacy.



Privacy

Menu 

[Privacy Policy](#)

[My Account](#)



*Advertising – Privacy & Terms*

as published on June 29, 2016,  
downloaded on August 23, 2023, available at:

<https://web.archive.org/web/20160629135224/https://www.google.com/policies/technologies/ads/>  
/

The Wayback Machine - <https://web.archive.org/web/20160629135224/http://www.google.com/policies/technologies/ads/>



# Advertising

Advertising keeps Google and many of the websites and services you use free of charge. We work hard to make sure that ads are safe, unobtrusive, and as relevant as possible. For example, you won't see pop-up ads on Google, and we terminate the accounts of hundreds of thousands of publishers and advertisers that violate our policies each year – including ads containing malware, ads for counterfeit goods, or ads that attempt to misuse your personal information.

## How Google uses cookies in advertising

Cookies help to make advertising more effective. Without cookies, it's harder for an advertiser to reach its audience, or to know how many ads were shown and how many clicks they received.

Many websites, such as news sites and blogs, partner with Google to show ads to their visitors. Working with our partners, we may use cookies for a number of purposes, such as to stop you from seeing the same ad over and over again, to detect and stop click fraud, and to show ads that are likely to be more relevant (such as ads based on websites you have visited).

We store a record of the ads we serve in our logs. These [server logs](#) typically include your web request, IP address, browser type, browser language, the date and time of your request, and one or more cookies that may uniquely identify your browser. We store this data for a number of reasons, the most important of which are to improve our services and to maintain the security of our systems. We anonymize this log data by removing part of the IP address (after 9 months) and cookie information (after 18 months).

## Our advertising cookies

To help our partners manage their advertising and websites, we offer many products, including AdSense, AdWords, Google Analytics, and a range of DoubleClick-branded services. When you visit a page that uses one of these products, either on one of Google's sites or one of our partners', various cookies may be sent to your browser.

These may be set from a few different domains, including [google.com](#), [doubleclick.net](#), [invitemedia.com](#), [admeld.com](#), [googlesyndication.com](#), or [googleadservices.com](#). Some of our advertising products enable our partners to use other services in conjunction with ours (like an ad measurement and reporting service), and these services may send their own cookies to your browser. These cookies will be set from their domains.

See more detail about the [types of cookies used by Google](#) and our partners and [how we use them](#).

## How you can control advertising cookies

You can use Ads Settings to manage the Google ads you see and opt out of Ads Personalization. Even if you opt out of Ads Personalization, you may still see ads based on factors such as your general location derived from your IP address, your browser type, and your search terms.

You can also manage many companies' cookies used for online advertising via the consumer choice tools created under self-regulation programs in many countries, such as the US-based [aboutads.info choices page](#) or the EU-based [Your Online Choices](#).

Finally, you can [manage cookies in your web browser](#).

### Other technologies used in advertising

Google's advertising systems may use other technologies, including Flash and HTML5, for functions like display of interactive ad formats. We may use the [IP address](#), for example, to identify your general location. We may also select advertising based on information about your computer or device, such as your device model, browser type, or sensors in your device like the accelerometer.

### Location

Google's ad products may receive or infer information about your location from a variety of sources. For example, we may use the IP address to identify your general location; we may receive precise location from your mobile device; we may infer your location from your search queries; and websites or apps that you use may send information about your location to us. Google uses location information in our ads products to infer demographic information, to improve the relevance of the ads you see, to measure ad performance and to report aggregate statistics to advertisers.

## Advertising identifiers on mobile devices

To serve ads in services where cookie technology may not be available (for example, in mobile applications), we may use technologies that perform similar functions to cookies. Sometimes Google links the identifier used for advertising on mobile applications to an advertising cookie on the same device in order to coordinate ads across your mobile apps and mobile browser. This can happen, for example, when you see an ad within an app that launches a web page in your mobile browser. This also helps us improve the reports we give to our advertisers on the effectiveness of their campaigns.

To opt out of personalized ads in apps on your mobile device, follow the instructions below.

### Android

1. Find Google Settings in one of these places (depending on your device):
  1. A separate app called **Google Settings**
  2. In your main **Settings** app, scroll down and tap **Google**
2. Tap **Ads**
3. Switch on **Opt out of interest-based ads**

### iOS

Devices with iOS use Apple's Advertising Identifier. To learn more about your choices for use of this identifier, visit the **Settings** app on your device.

## What determines the ads by Google that I see?

Many decisions are made to determine which ad you see.

Sometimes the ad you see is based on your current or past location. Your IP address is usually a good indication of your approximate location. So you might see an ad on the homepage of YouTube.com that promotes a forthcoming movie in your country, or a search for 'pizza' might return results for pizza places in your town.

Sometimes the ad you see is based on the context of a page. If you're looking at a page of gardening tips, you might see ads for gardening equipment.

Sometimes you might also see an ad on the web that's based on your app activity or activity on Google services; an in-app ad that's based on your web activity; or an ad based on your activity on another device.

Sometimes the ad you see on a page is served by Google but selected by another company. For example, you might have registered with a newspaper website. From information you've given the newspaper, it can make decisions about which ads to show you, and it can use Google's ad serving products to deliver those ads.

You may also see ads on Google products and services, including Search, Gmail, and YouTube, based on information, such as your email address, that you provided to advertisers and the advertisers then shared with Google.

## Why am I seeing ads by Google for products I've viewed?

You may see ads for products you previously viewed. Let's suppose you visit a website that sells golf clubs, but you don't buy those clubs on your first visit. The website owner might want to encourage you to return and complete your purchase. Google offers services that let website operators target their ads to people who visited their pages.

For this to work, Google either reads a cookie that's already in your browser or places a cookie in your browser when you visit the golfing site (assuming your browser lets this happen).

When you visit another site that works with Google, which may have nothing to do with golfing, you might see an ad for those golf clubs. That's because your browser sends Google the same cookie. In turn, we may use that cookie to serve you an ad that could encourage you to buy those golf clubs.

Your visit to the golfing site may also be used by Google to show you personalized ads when you later search for golf clubs on Google.

We do have restrictions on this type of ad. For example, we prohibit advertisers from selecting an audience based on sensitive information, such as health information or religious beliefs.

Learn more about [Google ads](#).

## *Key Terms – Privacy & Terms*

as published on June 27, 2016,  
downloaded on August 24, 2023, available at:

<https://web.archive.org/web/20160627215305/https://www.google.com/policies/privacy/key-terms/>

The Wayback Machine - <https://web.archive.org/web/20160627215305/http://www.google.com:80/policies/privacy/key-terms/>



## Key terms

- Affiliates
- Application data cache
- Browser web storage
- Cookies and similar technologies
- Device
- Google Account
- HTTP Referrer
- IP address
- Non-personally identifiable information
- Personal information
- Pixel tag
- Sensitive Categories
- Sensitive personal information
- Server logs
- Unique device identifier

### Affiliates

An affiliate is an entity that belongs to the Google group of companies.

### Application data cache

An application data cache is a data repository on a device. It can, for example, enable a web application to run without an internet connection and improve the performance of the application by enabling faster loading of content.

### Browser web storage

Browser web storage enables websites to store data in a browser on a device. When used in "local storage" mode, it enables data to be stored across sessions (for example, so that the data are retrievable even after the browser has been closed and reopened). One technology that facilitates web storage is HTML 5.

### Cookies and similar technologies

A cookie is a small file containing a string of characters that is sent to your computer when you visit a website. When you visit the website again, the cookie allows that site to recognize your browser. Cookies may store user preferences and other information. You can reset your browser to refuse all cookies or to indicate when a cookie is being sent. However, some website features or services may not function properly without cookies. Other technologies are used for similar purposes as a cookie on other platforms where cookies are not available or applicable, such as the Advertising ID available on Android mobile devices. Learn more about [how Google uses cookies](#) and how Google uses data, including cookies, [when you use our partners' sites or apps](#).

## **Device**

A device is a computer that can be used to access Google services. For example, a device could be a desktop, tablet or smartphone.

## **Google Account**

You may access some of our services by signing up for a [Google Account](#) and providing us with some personal information (typically your name, email address and a password). This account information will be used to authenticate you when you access Google services and protect your account from unauthorized access by others. You can edit or terminate your account at any time through your [Google Account settings](#).

## **HTTP Referrer**

An HTTP Referrer is information transmitted to a destination webpage by a web browser, typically when you click a link to that webpage. The HTTP Referrer contains the URL of the last webpage the browser visited.

## **IP address**

Every device connected to the Internet is assigned a number known as an Internet protocol (IP) address. These numbers are usually assigned in geographic blocks. An IP address can often be used to identify the location from which a device is connecting to the Internet.

## **Non-personally identifiable information**

This is information that is recorded about users so that it no longer reflects or references an individually identifiable user.

## **Personal information**

This is information which you provide to us which personally identifies you, such as your name, email address or billing information, or other data which can be reasonably linked to such information by Google, such as information we associate with your Google account.

## **Pixel tag**

A pixel tag is a type of technology placed on a website or within the body of an email for the purpose of tracking activity on websites, or when emails are opened or accessed, and is often used in combination with cookies.

## **Sensitive Categories**

An advertising category may be sensitive if it relates to topics such as race, religion, sexual orientation or health. When showing you tailored ads, we may associate a cookie or anonymous identifier with interests such as "Cooking and Recipes" or "Air Travel," but not with sensitive categories. We impose a similar policy on our advertisers.



## Sensitive personal information

This is a particular category of personal information relating to confidential medical facts, racial or ethnic origins, political or religious beliefs or sexuality.

## Server logs

Like most websites, our servers automatically record the page requests made when you visit our sites. These “server logs” typically include your web request, Internet Protocol address, browser type, browser language, the date and time of your request and one or more cookies that may uniquely identify your browser.

Here is an example of a typical log entry where the search is for “cars”, followed by a breakdown of its parts:

```
123.45.67.89 - 25/Mar/2003 10:15:32 -
http://www.google.com/search?q=cars -
Firefox 1.0.7; Windows NT 5.1 - 740674ce2123e969
```

- 123.45.67.89 is the Internet Protocol address assigned to the user by the user's ISP; depending on the user's service, a different address may be assigned to the user by their service provider each time they connect to the Internet;
- 25/Mar/2003 10:15:32 is the date and time of the query;
- <http://www.google.com/search?q=cars> is the requested URL, including the search query;
- Firefox 1.0.7; Windows NT 5.1 is the browser and operating system being used; and
- 740674ce2123e969 is the unique cookie ID assigned to this particular computer the first time it visited Google. (Cookies can be deleted by users. If the user has deleted the cookie from the computer since the last time s/he visited Google, then it will be the unique cookie ID assigned to the user the next time s/he visits Google from that particular computer).

## Unique device identifier

A unique device identifier (sometimes called a universally unique ID or UUID) is a string of characters that is incorporated into a device by its manufacturer and can be used to uniquely identify that device (for example an IMEI-number of a mobile phone). Different device identifiers vary in how permanent they are, whether they can be reset by users, and how they can be accessed. A given device may have several different unique device identifiers. Unique device identifiers can be used for various purposes, including security and fraud detection, syncing services such as a user's email inbox, remembering the user's preferences and providing relevant advertising.



***How Google uses data when you use our apps –  
Privacy & Terms***

as published July 18, 2016,  
downloaded on August 24, 2023, available at:

**<https://web.archive.org/web/20160718100338/http://www.google.com/policies/privacy/partners/>**

The Wayback Machine - <https://web.archive.org/web/20160718100338/http://www.google.com:80/policies/privacy/partners/>



# How Google uses data when you use our partners' sites or apps

Many websites use Google technologies to improve their content and keep it free. When you visit a website that uses our advertising products (like AdSense), social products (like the +1 button), or analytics tools (Google Analytics), your web browser automatically sends certain information to Google. This includes, for example, the web address of the page that you're visiting and your IP address. We may also set cookies on your browser or read cookies that are already there.

Similarly, apps that partner with Google can send us information such as the name of the app and an identifier that helps us to determine which ads we've served to other apps on your device. If you are signed in to your Google Account, and depending on your Account settings, we may add that information to your Account, and treat it as personal information.

## How we use the information sent by your browser

When you visit websites or use apps that use Google technologies, we may use the information we receive from those websites and apps to, for example:

- Make ads more effective
- Provide reports of ads activity to advertisers and websites hosting the ads, and to ensure payment to those website publishers
- Help website and app owners using Google Analytics to understand how visitors engage with their sites or apps
- Improve your Google+ experience
- Detect and defend against fraud and other security risks to protect users and partners
- Meet our legal duties
- Improve our products

## How you can control the information sent to Google

For tips and advice on staying safe and managing your data online, visit the [Google Safety Center](#).

Here are some of the ways you can control the information that is shared by your web browser when you visit or interact with Google services on partners' sites across the web:

- [Ads Settings](#) helps you control the ads by Google that you see across the web. You can learn how ads are selected for you, opt out of Ads Personalization, and block specific advertisers. Learn more about [advertising](#).
- If you are signed in to your Google Account, and depending on your Account settings, you can see and edit some of the information we collect from the sites and apps you have visited.

- Many sites across the web use Google Analytics to understand how visitors engage with their sites or apps. If you don't want Analytics to be used in your browser, you can install the [Google Analytics browser add-on](#). Learn more about [Google Analytics and privacy](#).
- Google makes it easy for you to make recommendations for your friends - for example, by clicking the +1 button on content you like. Some of your +1s may show your name and Google+ profile photo in ads, but you can [opt out](#) if you don't want to appear in ads. You can also visit the +1 tab on your Google+ profile to review and manage all of your +1's. [Learn more](#) about how to get to your +1 tab.
- [Incognito mode](#) in Chrome allows you to browse the web without recording webpages and files in your browser history. Cookies are deleted after you've closed all of your incognito windows and tabs, and your bookmarks and settings are stored until you delete them. Learn more about [cookies](#).

*Advertising – Privacy & Terms*

as published on April 4, 2018,  
downloaded on August 23, 2023, available at:  
<https://web.archive.org/web/20180404001532/https://policies.google.com/technologies/ads>

[Privacy & Terms](#)

Technologies

## Advertising

How Google uses cookies

How Google uses pattern recognition

Types of location data used by Google

How Google Wallet uses credit card numbers

How Google Voice works

Google Product Privacy Guide

## Advertising

Advertising keeps Google and many of the websites and services you use free of charge. We work hard to make sure that ads are safe, unobtrusive, and as relevant as possible. For example, you won't see pop-up ads on Google, and we terminate the accounts of hundreds of thousands of publishers and advertisers that violate our policies each year – including ads containing malware, ads for counterfeit goods, or ads that attempt to misuse your personal information.

How Google uses cookies in advertising

Cookies help to make advertising more effective. Without cookies, it's harder for an advertiser to reach its audience, or to know how many ads were shown and how many clicks they received.

Many websites, such as news sites and blogs, partner with Google to show ads to their visitors. Working with our partners, we may use cookies for a number of purposes, such as to stop you from seeing the same ad over and over again, to detect and stop click fraud, and to show ads that are likely to be more relevant (such as ads based on websites you have visited).

We store a record of the ads we serve in our logs. These server logs typically include your web request, IP address, browser type, browser language, the date and time of your request, and one or more cookies that may uniquely identify your browser. We store this data for a number of reasons, the most important of which are to improve our services and to maintain the security of our systems. We anonymize this log data by removing part of the IP address (after 9 months) and cookie information (after 18 months).

### Our advertising cookies

To help our partners manage their advertising and websites, we offer many products, including AdSense, AdWords, Google Analytics, and a range of DoubleClick-branded services. When you visit a page or see an ad that uses one of these products, either on Google services or on other sites and apps, various cookies may be sent to your browser.

These may be set from a few different domains, including google.com, doubleclick.net, googlesyndication.com, or googleadservices.com, or the domain of our partners' sites. Some of our advertising products enable our partners to use other services in conjunction with ours (like an ad measurement and reporting service), and these services may send their own cookies to your browser. These cookies will be set from their domains.

See more detail about the types of cookies used by Google and our partners and [how we use them](#).

### How you can control advertising cookies

You can use Ads Settings to manage the Google ads you see and opt out of Ads Personalization. Even if you opt out of Ads Personalization, you may still see ads based on factors such as your general location derived from your IP address, your browser type, and your search terms.

You can also manage many companies' cookies used for online advertising via the consumer choice tools created under self-regulation programs in many countries, such as the US-based [aboutads.info](#) choices page or the EU-based [Your Online Choices](#).

Finally, you can [manage cookies](#) in your web browser.

### Other technologies used in advertising

Google's advertising systems may use other technologies, including Flash and HTML5, for functions like display of interactive ad formats. We may use the [IP address](#), for example, to identify your general location. We may also select advertising based on information about your computer or device, such as your device model, browser type, or sensors in your device like the accelerometer.

## Location

Google's ad products may receive or infer information about your location from a variety of sources. For example, we may use the IP address to identify your general location; we may receive precise location from your mobile device; we may infer your location from your search queries; and websites or apps that you use may send information about your location to us. Google uses location information in our ads products to infer demographic information, to improve the relevance of the ads you see, to measure ad performance and to report aggregate statistics to advertisers.

## Advertising identifiers for mobile apps

To serve ads in services where cookie technology may not be available (for example, in mobile applications), we may use technologies that perform similar functions to cookies. Sometimes Google links the identifier used for advertising on mobile applications to an advertising cookie on the same device in order to coordinate ads across your mobile apps and mobile browser. This can happen, for example, when you see an ad within an app that launches a web page in your mobile browser. This also helps us improve the reports we give to our advertisers on the effectiveness of their campaigns.

To opt out of personalized ads in apps on your mobile device, follow the instructions below.

## Android

1. Find Google Settings in one of these places (depending on your device):

- a. A separate app called **Google Settings**
- b. In your main **Settings** app, scroll down and tap **Google**

2. Tap **Ads**

3. Switch on **Opt out of interest-based ads**

## iOS

Devices with iOS use Apple's Advertising Identifier. To learn more about your choices for use of this identifier, visit the **Settings** app on your device.

## What determines the ads by Google that I see?

Many decisions are made to determine which ad you see.

Sometimes the ad you see is based on your current or past location. Your IP address is usually a good indication of your approximate location. So you might see an ad on the homepage of YouTube.com that promotes a forthcoming movie in your country, or a search for 'pizza' might return results for pizza places in your town.

Sometimes the ad you see is based on the context of a page. If you're looking at a page of gardening tips, you might see ads for gardening equipment.

Sometimes you might also see an ad on the web that's based on your app activity or activity on Google services; an in-app ad that's based on your web activity; or an ad based on your activity on another device.

Sometimes the ad you see on a page is served by Google but selected by another company. For example, you might have registered with a newspaper website. From information you've given the newspaper, it can make decisions about which ads to show you, and it can use Google's ad serving products to deliver those ads.

You may also see ads on Google products and services, including Search, Gmail, and YouTube, based on information, such as your email address, that you provided to advertisers and the advertisers then shared with Google.

#### **Why am I seeing ads by Google for products I've viewed?**

You may see ads for products you previously viewed. Let's suppose you visit a website that sells golf clubs, but you don't buy those clubs on your first visit. The website owner might want to encourage you to return and complete your purchase. Google offers services that let website operators target their ads to people who visited their pages.

For this to work, Google either reads a cookie that's already in your browser or places a cookie in your browser when you visit the golfing site (assuming your browser lets this happen).

When you visit another site that works with Google, which may have nothing to do with golfing, you might see an ad for those golf clubs. That's because your browser sends Google the same cookie. In turn, we may use that cookie to serve you an ad that could encourage you to buy those golf clubs.

Your visit to the golfing site may also be used by Google to show you personalized ads when you later search for golf clubs on Google.

We do have restrictions on this type of ad. For example, we prohibit advertisers from selecting an audience based on sensitive information, such as health information or religious beliefs.

Learn more about [Google ads](#).

#### **Our legal policies**

[Privacy Policy](#)

[Terms of Service](#)

[FAQ](#)





**More information**

Technologies and Principles

Advertising

How Google uses cookies

How Google uses pattern recognition

Types of location data used by Google

How Google Wallet uses credit card numbers

How Google Voice works

How Google uses data when you use our partners' sites or apps

**Additional resources**

My Account

Google Safety Center

Google Product Privacy Guide

Your privacy, security, and controls

English 

Google · About Google · Privacy · Terms

# Appendix A-8

Catch up on highlights from Firebase at Google I/O 2023. [Learn more](https://firebase.blog/posts/2023/05/whats-new-at-google-io)  
 (https://firebase.blog/posts/2023/05/whats-new-at-google-io)

# Google Analytics



Google Analytics is an app measurement solution, available at no charge, that provides insight on app usage and user engagement.

At the heart of Firebase is Google Analytics, an unlimited analytics solution available at no charge. Analytics integrates across Firebase features and provides you with unlimited reporting for up to 500 distinct events that you can define using the Firebase SDK. Analytics reports help you understand clearly how your users behave, which enables you to make informed decisions regarding app marketing and performance optimizations.

Introducing Google Analytics...



[Web setup](https://docs/analytics/get-started?platform=web) (/docs/analytics/get-started?platform=web)

[iOS+ setup](https://docs/analytics/get-started?platform=ios) (/docs/analytics/get-started?platform=ios)

[Android setup](https://docs/analytics/get-started?platform=android) (/docs/analytics/get-started?platform=android)

[Flutter setup](https://docs/analytics/get-started?platform=flutter) (/docs/analytics/get-started?platform=flutter)

[C++ setup](https://docs/analytics/cpp/start) (/docs/analytics/cpp/start) [Unity setup](https://docs/analytics/unity/start) (/docs/analytics/unity/start)

## Key capabilities

Unlimited Reporting

Analytics provides unlimited reporting on up to 500 distinct events.

## Audience Segmentation

Custom audiences can be defined in the Firebase console based on device data, custom events, or user properties. These audiences can be used with other Firebase features when targeting new features or notification messages.

## How does it work?

Google Analytics helps you understand how people use your web, Apple, or Android app. The SDK automatically captures a number of events and user properties and also allows you to define your own custom events to measure the things that uniquely matter to your business. Once the data is captured, it's available in a dashboard through the Firebase console. This dashboard provides detailed insights about your data — from summary data such as active users and demographics, to more detailed data such as identifying your most purchased items.

Analytics also integrates with a number of other Firebase features. For example, it automatically logs events that correspond to notification messages sent via the Notifications composer and provides reporting on the impact of each campaign.

Analytics helps you understand how your users behave, so you can make informed decisions about how to market your app. See the performance of your campaigns across organic and paid channels to understand which methods are most effective at driving high-value users. If you need to perform custom analysis or join your data with other sources you can link your Analytics data to BigQuery, which allows for more complex analysis like querying large data sets and joining multiple data sources.

## Integrations with other services

### BigQuery

[Link your Firebase app to BigQuery](https://support.google.com/firebase/answer/6318765)

(<https://support.google.com/firebase/answer/6318765>) where you can

perform custom analysis on your entire Analytics dataset and import other data sources.

#### Crashlytics

Analytics logs events for each crash so you can get a sense of the rate of crashes for different versions or regions, allowing you to gain insight into which users are impacted. You can also create audiences for users who have experienced multiple crashes and respond with notification messages directed at that audience.

#### FCM

Analytics automatically logs events that correspond to notification messages sent via the Notifications composer and supports reporting on the impact of each campaign.

#### Firebase Remote Config

Use Analytics audience definitions to change the behavior and appearance of your app for different audiences without distributing multiple versions of your app.

#### Google Tag Manager

Integrating [Google Tag Manager](https://developers.google.com/tag-manager/) (<https://developers.google.com/tag-manager/>) alongside Google Analytics enables you to manage your Analytics implementation remotely from a web interface after your app has been distributed.

## Implementation path

1

Connect your app to Firebase

Getting started with Analytics is easy. Just add the Firebase SDK to your new or existing app, and data collection begins automatically.

You can view analytics data in the Firebase console within hours.

2

Log custom data

You can use Analytics to log custom events that make sense for your app, like E-Commerce purchases or achievements.

3

Create audiences

You can define the audiences that matter to you in the Firebase console.

4

Target audiences

Use your custom audiences to target messages, promotions, or new app features using other Firebase features, such as FCM, and Remote Config.

## Next steps

- Add Google Analytics to your [web](/docs/analytics/get-started?platform=web) (/docs/analytics/get-started?platform=web), [Apple](/docs/analytics/get-started?platform=ios) (/docs/analytics/get-started?platform=ios), [Android](/docs/analytics/get-started?platform=android) (/docs/analytics/get-started?platform=android), or [Flutter](/docs/analytics/get-started?platform=flutter) (/docs/analytics/get-started?platform=flutter) app.
- Download [sample code](/docs/samples) (/docs/samples).

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Last updated 2023-08-22 UTC.

# Appendix A-9

## [GA4] Automatically collected events

Automatically collected events are triggered by basic interactions with your app and/or site (as indicated under the event name in the table below). As long as you use [the Google Analytics for Firebase SDK](#) or [gtag.js](#), you don't need to write any additional code to collect these events.

Analytics collects events for Android *and* iOS apps unless otherwise stated. The names and parameters of these events can be helpful when accessing your raw event data in [BigQuery](#).

### Note

The following parameters are collected by default with every event, including [custom events](#). The automatically collected events that don't have parameters listed in the table below only receive the following parameters:

- *language*
- *page\_location*
- *page\_referrer*
- *page\_title*
- *screen\_resolution*

The value assigned to event parameters must be 100 characters or fewer. The *page\_title* parameter must be 300 characters or fewer. The *page\_referrer* parameter must be 420 characters or fewer. The *page\_location* parameter must be 1,000 characters or fewer.

If you override the *page\_location* parameter, make sure that the URL path is valid. If you assign an invalid URL path, the *Page location* dimension will be empty. You can use the [Campaign URL Builder](#) to check whether a URL path is valid.

Event	Automatically triggered...	Parameters
ad_click (app)	when a user clicks an ad  Publisher events coming from AdMob via the Google Mobile Ads SDK or Ad Manager via the Ad Manager integration  This event is not exported to BigQuery.	ad_event_id
ad_exposure (app)	when at least one ad served by the Mobile Ads SDK is on screen  This event does not appear in reports and is not exported to BigQuery.	firebase_screen, firebase_screen_id, firebase_screen_class, exposure_time
ad_impression (app)	when a user sees an ad impression  Publisher events coming from AdMob via the Google Mobile Ads SDK or Ad Manager via the Ad Manager integration  This event is not exported to BigQuery.	ad_event_id, value*
ad_query (app)	when an ad request is made by the Mobile Ads SDK  This event does not appear in reports and is not exported to BigQuery.	ad_event_id
ad_reward (app)	when a reward is granted by a rewarded ad served by the Mobile Ads SDK	ad_unit_code, reward_type, reward_value



8/24/23, 1:00 AM

OGA All Android automatically collected events Firebase Help

adunit_exposure (app)	<p>when an ad unit served by the Mobile Ads SDK is on screen</p> <p>This event does not appear in reports and is not exported to BigQuery.</p>	<p>firebase_screen, firebase_screen_id, firebase_screen_class, exposure_time</p>
app_clear_data (app)	<p>when the user resets/clears the app data, removing all settings and sign-in data</p> <p>Android only</p>	
app_exception (app)	<p>when the app crashes or throws an exception</p> <p>The event is sent when you integrate <a href="#">Firebase Crashlytics</a>.</p>	<p>fatal, timestamp, engagement_time_msec</p>
app_remove (app)	<p>when an application package is removed (uninstalled) from an Android device</p> <p>Android only</p> <p>This event is different from the <i>Daily uninstalls by device</i> and <i>Daily uninstalls by user</i> metrics, which are both <a href="#">reported by Google Play Developer Console</a> <a href="#">🔗</a>. The <i>app_remove</i> event counts the removal of application packages, regardless of the installation source, and the count changes depending on the date range you are using for the report. The <i>Daily uninstalls by device</i> and <i>Daily uninstalls by user</i> metrics count the removal of application packages only when they were installed from Google Play, and are reported on a daily basis.</p>	
app_store_refund (app)	<p>when an in-app purchase is refunded by Google Play</p> <p>Android only</p> <p>This event is not exported to BigQuery.</p>	<p>product_id, value, currency, quantity</p>
app_store_subscription_cancel (app)	<p>when a paid subscription is cancelled in Google Play</p> <p>Android only</p> <p>Requires an initial subscription that was made on or after July 1, 2019.</p> <p>This event is not exported to BigQuery.</p>	<p>product_id, price, value, currency, cancellation_reason</p>
app_store_subscription_convert (app)	<p>when a free-trial subscription is converted to a paid subscription</p> <p>This event is set as a default conversion.</p> <p>Requires an initial subscription that was made on or after July 1, 2019. An initial free-trial subscription is logged as an <i>in_app_purchase</i> with the <i>subscription</i> parameter set to true.</p> <p>This event is not exported to BigQuery.</p>	<p>product_id, price, value, currency, quantity</p>
app_store_subscription_renew	<p>when a paid subscription is renewed</p> <p>This event is set as a default conversion.</p>	<p>product_id, price, value, currency, quantity, renewal_count</p>

8/24/23, 1:00 AM

(app)	Requires an initial subscription that was made on or after July 1, 2019.  This event is not exported to BigQuery.	
app_update (app)	when the app is updated to a new version and launched again  The previous app version id is passed as a parameter.  This event is conceptually different from the Daily upgrades by device metric, which is <a href="#">reported by Google Play Developer Console</a> <a href="#">🔗</a> . An upgrade refers to the updating of the application binary, whereas an app_update event is triggered upon the subsequent launch of the upgraded app.	previous_app_version
click (web)	each time a user clicks a link that leads away from the current domain  By default, outbound click events will occur for all links leading away from the current domain. Links to domains configured for <a href="#">cross-domain measurement</a> will not trigger outbound click events.  The parameters populate the following dimensions: <ul style="list-style-type: none"><li>• <a href="#">Link classes</a> (from link_classes)</li><li>• <a href="#">Link domain</a> (from link_domain)</li><li>• <a href="#">Link ID</a> (from link_id)</li><li>• <a href="#">Link URL</a> (from link_url)</li><li>• <a href="#">Outbound</a> (from outbound)</li></ul> Collected by default via <a href="#">enhanced measurement</a> .	link_classes, link_domain, link_id, link_url, outbound (boolean)
dynamic_link_app_open (app)	when a user re-opens the app via a dynamic link  <b>Note:</b> This event is being phased out as Firebase Dynamic Links is currently deprecated. <a href="#">Learn more about these changes.</a>	source, medium, campaign, link_id, accept_time
dynamic_link_app_update (app)	when the app is updated to a new version and is opened via a dynamic link  Android only  <b>Note:</b> This event is being phased out as Firebase Dynamic Links is currently deprecated. <a href="#">Learn more about these changes.</a>	source, medium, campaign, link_id, accept_time
dynamic_link_first_open (app)	when a user opens the app for the first time via a dynamic link  <b>Note:</b> This event is being phased out as Firebase Dynamic Links is currently deprecated. <a href="#">Learn more about these changes.</a>	source, medium, campaign, link_id, accept_time
error (app)	logged in place of an event that can't be logged because it is invalid in some way  _err (firebase_error), _ev (firebase_error_value), and _el (firebase_error_length) parameters have additional information.	firebase_error, firebase_error_value

8/24/23, 1:00 AM

	This event does not appear in reports and is not exported to BigQuery.	
file_download (web)	<p>when a user clicks a link leading to a file (with a common file extension) of the following types:</p> <ul style="list-style-type: none"> <li>• document</li> <li>• text</li> <li>• executable</li> <li>• presentation</li> <li>• compressed file</li> <li>• video</li> <li>• audio</li> </ul> <p>This event is collected by default via <a href="#">enhanced measurement</a>. See the <a href="#">file extensions that trigger the event</a></p>	file_extension, file_name link_classes, link_id, link_text, link_url
firebase_campaign (app)	<p>when the app is launched with campaign parameters</p> <p>This event does not appear in reports and is not exported to BigQuery.</p>	source, medium, campaign, term, content, gclid, acldid, cp1, anid, click_timestamp, campaign_info_source
firebase_in_app_message_action (app)	when a user takes action on a Firebase In-App Message	message_name, message_device_time, message_id
firebase_in_app_message_dismiss (app)	when a user dismisses a Firebase In-App Message	message_name, message_device_time, message_id
firebase_in_app_message_impression (app)	when a user sees a Firebase In-App Message	message_name, message_device_time, message_id
first_open (app)	<p>the first time a user launches an app after installing or re-installing it</p> <p>This event is not triggered when a user downloads the app onto a device, but instead when he or she first uses it. To see raw download numbers, look in Google Play Developer Console or in iTunesConnect.</p> <p>Supports measuring first_open conversions for users who accept Apple's iOS 14 app-tracking prompt.</p>	previous_gmp_app_id, updated_with_analytics, previous_first_open_count, system_app, system_app_update, deferred_analytics_collection, reset_analytics_cause, engagement_time_msec
first_visit (app, web)	the first time a user visits a website or launches an Android instant app with Analytics enabled	
form_start (web)	<p>the first time a user interacts with a form in a session</p> <p>Note: You can only use the parameters in your reports if you <a href="#">create custom dimensions</a> for them.</p> <p>Collected by default via <a href="#">enhanced measurement</a>.</p>	form_id, form_name, form_destination

8/24/23, 1:00 AM

[Google Analytics for Firebase Help](#)

form_submit (web)	<p>when the user submits a form</p> <p>Note: You can only use the parameters in your reports if you <a href="#">create custom dimensions</a> for them.</p> <p>Collected by default via <a href="#">enhanced measurement</a>.</p>	form_id, form_name, form_destination, form_submit_text
in_app_purchase (app)	<p>when a user completes an in-app purchase, including an initial subscription, that is processed by the Apple App Store or Google Play Store</p> <p>The product ID, product name, currency, and quantity are passed as parameters.</p> <p>This event is triggered only by versions of your app that include <a href="#">the Google Analytics for Firebase SDK</a>.</p> <p><b>Android:</b></p> <p>To see in-app purchase data for Android apps, <a href="#">link Analytics to Google Play</a>.</p> <p>Note that Analytics doesn't automatically measure paid-app purchase revenue. Also, your reported revenue in Google Analytics may differ from the values you see in the Google Play Developer Console.</p> <p>Analytics ignores events that are flagged as invalid or tests. <a href="#">Learn more</a> about testing Google Play billing.</p> <p><b>iOS:</b></p> <p>Note that Analytics doesn't automatically measure paid-app purchase revenue and refunds.</p> <p>Analytics ignores events that are flagged as invalid or sandbox.</p>	product_id, price, value, currency, quantity, subscription, free_trial, introductory_price
notification_dismiss (app)	<p>when a user dismisses a notification sent by Firebase Cloud Messaging (FCM)</p> <p>Android only</p>	message_name, message_time, message_device_time, message_id, topic, label, message_channel
notification_foreground (app)	<p>when a notification sent by FCM is received while the app is in the foreground</p>	message_name, message_time, message_device_time, message_id, topic, label, message_channel, message_type
notification_open (app)	<p>when a user opens a notification sent by FCM</p>	message_name, message_time, message_device_time, message_id, topic, label, message_channel
notification_receive (app)	<p>when a notification sent by FCM is received by a device when the app is in the background</p> <p>Android only</p>	message_name, message_time, message_device_time, message_id, topic, label, message_channel, message_type
os_update	<p>when the device operating system is updated to a new version. The previous operating system version id is passed as a parameter</p>	previous_os_version

8/24/23, 1:00 AM

(app)		
page_view (web)	each time the page loads or the browser history state is changed by the active site  Collected by default via <a href="#">enhanced measurement</a> .	page_location (page URL), page_referrer (previous page URL), engagement_time_msec
screen_view (app)	when a screen transition occurs and any of the following criteria are met: <ul style="list-style-type: none"> <li>No screen was previously set</li> <li>The new screen name differs from the previous screen name</li> <li>The new screen-class name differs from the previous screen-class name</li> <li>The new screen id differs from the previous screen id</li> </ul>	firebase_screen, firebase_screen_class, firebase_screen_id, firebase_previous_screen, firebase_previous_class, firebase_previous_id, engagement_time_msec
scroll (web)	the first time a user reaches the bottom of each page (i.e., when a 90% vertical depth becomes visible)  Collected by default via <a href="#">enhanced measurement</a> .	engagement_time_msec
session_start (app, web)	when a user engages the app or website  A session ID and session number are generated automatically with each session and associated with each event in the session. <a href="#">Learn more</a>	
user_engagement (app, web)	when the app is in the foreground or webpage is in focus for at least one second. <a href="#">Learn more</a>	engagement_time_msec
video_complete (web)	when the video ends  For embedded YouTube videos that have <a href="#">JS API support</a> enabled.  Collected by default via <a href="#">enhanced measurement</a> .	video_current_time, video_duration, video_percent, video_provider, video_title, video_url, visible (boolean)
video_progress (web)	when the video progresses past 10%, 25%, 50%, and 75% duration time  For embedded YouTube videos that have <a href="#">JS API support</a> enabled.  Collected by default via <a href="#">enhanced measurement</a> .	video_current_time, video_duration, video_percent, video_provider, video_title, video_url, visible (boolean)
video_start (web)	when the video starts playing  For embedded YouTube videos that have <a href="#">JS API support</a> enabled.  Collected by default via <a href="#">enhanced measurement</a> .	video_current_time, video_duration, video_percent, video_provider, video_title, video_url, visible (boolean)
view_search_results (web)	each time a user performs a site search, indicated by the presence of a URL query parameter  Collected by default via <a href="#">enhanced measurement</a> .	search_term, optionally 'q_<additional key="">' (where <additional key=""> matches an additional query parameter you specify to be collected under advanced settings)  Note: This event only sends the unique_search_term

8/24/23, 1:00 AM

		parameter when it has a value of 1 (i.e. when the string is unique to that session).
--	--	--

**Note:** File extensions that match the following regex will trigger the [file\\_download](#) event:

`pdf|xlsx?|docx?|txt|rtf|csv|exe|key|pp(s|t|tx)|7z|pkg|rar|gz|zip|avi|mov|mp4|mpe?g|wmv|midi?|mp3|wav|wma`

\* no\_ad\_impression value or currency is passed with the default integration

# Appendix A-10

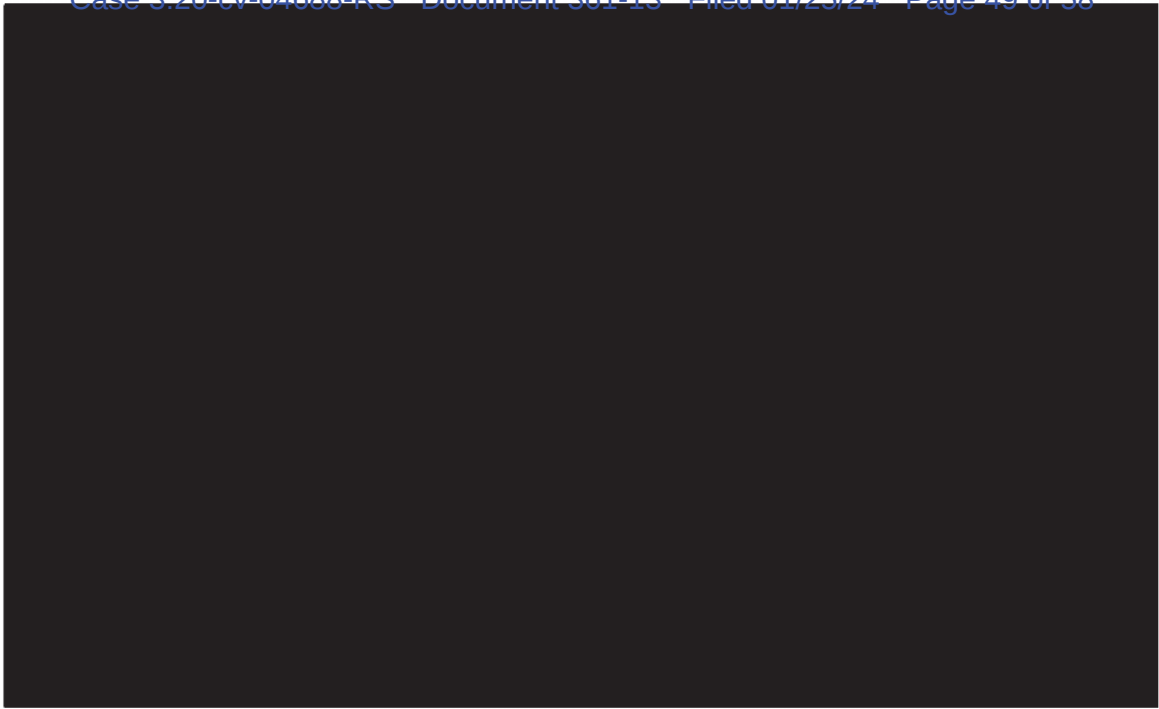


# GEO Privacy Champion

## Key Privacy Concepts

Privileged & Confidential





# Appendix A-11

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**UNITED STATES DISTRICT COURT  
 NORTHERN DISTRICT OF CALIFORNIA**

ANIBAL RODRIGUEZ, SAL CATALDO,  
 JULIAN SANTIAGO, and SUSAN LYNN  
 HARVEY individually and on behalf of all  
 other similarly situated,

Plaintiffs,

v.

GOOGLE LLC,

Defendant.

Case No.: 3:20-cv-04688-RS

**DECLARATION OF JONATHAN  
 HOCHMAN IN SUPPORT OF  
 PLAINTIFFS' MOTION FOR CLASS  
 CERTIFICATION**

Judge: Hon. Richard Seeborg  
 Courtroom 3 – 17th Floor  
 Date: October 5, 2023  
 Time: 1:30 p.m.

**DECLARATION OF JONATHAN HOCHMAN**

I, Jonathan Hochman, declare as follows.

1. Counsel for the *Rodriguez* Plaintiffs retained me to provide expert analysis and, if requested, expert testimony. I have personal knowledge of the matters set forth herein and am competent to testify.

2. I submit this declaration in connection with Plaintiffs' Motion for Class Certification.

3. Attached is a true and correct copy of the Expert Report that I prepared in connection with this matter, dated March 22, 2023. The opinions I provided therein are true and correct to the best of my knowledge.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct. Executed this 17th day of July, 2023, at New London, CT

/s/ Jonathan E. Hochman

**FOR THE NORTHERN DISTRICT  
OF CALIFORNIA**

***Defendant.***

[illegible]

Case No. 3:20-cv-04688-RS

**March 22, 2023**

Google” because, among other things, it “[b]oosts downstream business opportunities,” in “Ads, Play, Cloud and more” (GOOG-RDGZ-00056947 at -956).<sup>44</sup>

62. As mentioned above, one of the products in the Firebase suite is an analytics product, which was initially released as Firebase Analytics and was rebranded as Google Analytics for Firebase (GA4F) in May 2017 (GOOG-RDGZ-00059723 at -723; GOOG-RDGZ-00057998 at -999; Ganem Tr. 18:11-15, 106:12-14). GA4F is an app measurement tool, which collects data relating to user activity on apps. To use GA4F, app developers must embed the Firebase SDK code into their apps. Google internally refers to its app measurement efforts, including GA4F, by the codename “Scion.”<sup>45</sup> GA4F adoption is important to Google, as it allows Google to collect and save “high-fidelity signals to power Ads ML [machine learning]” technology (GOOG-RDGZ-00177709 at -711). GA4F “is the most-used analytics SDK on Android, in use by over 1.2M apps, including many large 3P [non-Google owned] and 1P [Google owned] apps” (GOOG-RDGZ-00050615 at -615).

63. For app developers who use Firebase, GA4F is enabled by default (GOOG-RDGZ-00092368 at -372). Google recognizes that “full functionality across the services *requires* our analytics to be on” (GOOG-RDGZ-00092368 at -372). GA4F “is tightly integrated with Ads,” and “shares a developer’s analytics data to enhance our advertising services” by default (GOOG-RDGZ-00092368 at -372).

<sup>44</sup> Google ads refers to Google’s advertising business, including serving advertisements in mobile apps as well as ad performance tracking. Google derives most of its hundreds of billions of annual revenue from its advertising business. *Form 10-K*, <https://www.sec.gov/Archives/edgar/data/1652044/000165204422000019/goog-20211231.htm> (Last accessed March 17, 2013). Google Play refers to Google’s Play App Store through which users can download and install apps on Android devices. Google charges developers a service fee as a percentage of their earnings related to app purchases. *Play Console Help*, Google, <https://support.google.com/googleplay/android-developer/answer/11131145?hl=en> (Last accessed March 17, 2023). Google Cloud offers hosting, data storage and data analysis services with a pay-as-you-go fee structure. *Google Cloud*, Google, <https://cloud.google.com> (Last accessed March 17, 2023).

<sup>45</sup> GOOG-RDGZ-00051774 at -776; Ganem Tr. 106:9-11 (“Scion is an internal code name that is associated with our app measurement efforts in Google Analytics.”).

83. I will use the term “sWAA-off data” to refer to data generated during a user’s interaction with a non-Google mobile app while that user is signed into a Google account and her sWAA toggle was set to “off” (or equivalently “paused” or “disabled”). Note that sWAA-off data necessarily encompasses WAA-off data because sWAA cannot be turned on when WAA is turned off. However, a user can turn on WAA while turning off sWAA.

84. Google has collected WAA-off and sWAA-off data by way of Google Analytics for Firebase, app advertising products (i.e., AdMob and Ad Manager), and Firebase Cloud Messaging.

### **1. Google Analytics for Firebase**

85. Irrespective of whether WAA or sWAA is set to on or off, Google has collected user data through Google Analytics for Firebase throughout the class period and across class members. Notwithstanding its public representations, Google admitted in this litigation that “WAA has never controlled whether Google Analytics for Firebase collects and sends user activity data from third party apps to Google servers” (Google’s Supp. Resp. to Interrog. No. 4). WAA “functions independently from Google Analytics for Firebase,” and therefore “turning off Web & App Activity does not prevent” Google from collecting data by way of Google Analytics for Firebase (Google’s Resp. to RFA No. 1). Google processes user data “regardless of whether [they] have WAA on or off” (Google’s Resp. to RFA No. 20).

86. My opinion is further supported by David Monsees<sup>72</sup> and Steve Ganem’s deposition testimony that Google checks the user’s WAA and sWAA status on its own servers, rather than the user’s device.<sup>73</sup> That means that Google must collect and save data regardless of a user’s WAA

<sup>72</sup> Mr. Monsees has been a Google employee since 2009 and is currently the product manager for Footprints (Monsees Tr. 18:21-22, 23:25-24:1).

<sup>73</sup> When questioned why Google Analytics would not check a local cache setting, like App Indexing, before uploading to Google servers, Mr. Monsees responded that “different services like Google Analytics might have other bases to process that data.” Mr. Monsees further stated that he was not aware of any document that could explain “the logic behind the differences as to why some products with sWAA controls would check locally versus

and sWAA settings. Only after Google collects and saves app activity data does Google check the user's WAA and sWAA settings (Monsees Tr. 96:1-13), and even then Google saves WAA-off and sWAA-off data.<sup>74</sup> Google could have designed GA4F and the GMA SDK to check the user's WAA and sWAA settings on the device. Google's App Indexing product, for example, checks the user's device for the sWAA setting and does not send data to Google's servers if sWAA is off (Monsees Tr. 215:13-18, 303:4-10). Google chose not to design GA4F and the GMA SDK this way.

87. In the rest of this subsection, I explain the types of data and identifiers collected by Google Analytics for Firebase. As I discussed, WAA and sWAA settings have no impact on the types of data collected by Google app analytics products, including because a user's WAA and sWAA settings are not checked until data reaches Google servers. Even then, Google systematically saves and uses WAA-off and sWAA-off data for its own benefit. The data that Google collects and saves is essentially unaffected by the user's WAA and sWAA settings, except when sWAA is off, Google saves data only with persistent Google identifiers other than GAIA. In effect, the controls are a placebo. The user is given the choice whether they want to see some of the data Google collects and saves, or if the user would prefer to remain blissfully ignorant that Google is spying on their most private moments as they interact with their mobile devices.

88. Google Analytics for Firebase (GA4F) is a key component of Firebase and is included with the Firebase SDK implementation (GOOG-RDGZ-00187017 at -018). Documents that Google produced in this litigation confirm that GA4F provides "[c]omprehensive event-centric in-App

not check locally before uploading the data to Google servers," and that these decisions were "per service basis" (Monsees Tr. 216:24-218:1); *see also* Ganem Tr. 113:10-11.

<sup>74</sup>

[REDACTED]

(Monsees Tr. 310:8-20).



‘behavioral’ analytics” and an “[a]cross-network attribution tool” (GOOG-RDGZ-00187017 at -018).

89. Among other things, GA4F collects data about events, parameters, and user properties. Events are activities that users perform on an app, such as opening the app for the first time (a “first open”), loading a new page (a “screen view”), selecting content on a page (“select\_content”), or making an in-app purchase (Answer ¶ 51). Google collects additional information about these events, and each piece of additional information is a “parameter.” For example, when a user makes an in-app purchase, GA4F also collects an identifier for the product, as well as its price, currency, and quantity.<sup>75</sup> When a user loads a new page, GA4F also collects information about the identity of the page (page\_title), the length of time the user spends on that page (engagement\_time\_msec), as well as information about the last page the user was on.<sup>76</sup> GA4F also collects “user properties,” which are data about users themselves, as opposed to their activity (GOOG-RDGZ-00187017 at -018). User properties include age, gender, interests, operating system, location, language, and potentially even “favorite food.”<sup>77</sup> While Google describes the collected events, parameters, and user properties to developers in online developer support pages, nowhere does Google disclose that it collects this data even if the user’s WAA or sWAA setting is turned off.

90. Through GA4F, Google collects information about a “core set” of events, automatically and “[o]ut-of-the box” (GOOG-RDGZ-00187017 at -018). These events include “installs (‘first opens’),” “in-app purchases,” operating system updates (“os\_update”), the start of a session of app activity (“session\_start”), and user engagement with the app (“user\_engagement”) (GOOG-

<sup>75</sup> [GA4] *Automatically Collected Events*, Google Analytics Help, <https://support.google.com/analytics/answer/9234069?hl=en> (Last accessed March 13, 2023).

<sup>76</sup> [GA4] *Automatically Collected Events*, Google Analytics Help, <https://support.google.com/analytics/answer/9234069?hl=en> (Last accessed March 13, 2023).

<sup>77</sup> [GA4] *User Properties*, Google Analytics Help, <https://support.google.com/analytics/answer/9355671?hl=en> (Last accessed March 13, 2023).

RDGZ-00187017 at -018; GOOG-RDGZ-00195309 at -490). GA4F includes “10+ automatically captured events” (GOOG-RDGZ-00187017 at -018). Indeed, Google acknowledges that “there are at least 26 events that can be collected through GA for Firebase automatically” (Answer ¶ 52).

91. Through GA4F, Google also collects a set of parameters automatically.<sup>78</sup> Each automatically collected event has a set of automatically collected parameters. These include, for example, “firebase\_screen”, “firebase\_screen\_class”, “firebase\_screen\_id”, “firebase\_previous\_screen”, “firebase\_previous\_class”, “firebase\_previous\_id”, and “engagement\_time\_msec” for the “screen\_view” event. Other events automatically collect parameters such as title of the page (“page\_title”), data associated with the URL of the page (“page\_location”), screen information (including “screen\_resolution”), and session information.<sup>79</sup> Through GA4F, Google collects the mobile equivalents of a webpage URL and “referrer,”<sup>80</sup> which tells Google exactly which screen the user is viewing in the application. Google also uses GA4F to automatically collect other parameters only for specific events. For example, GA4F automatically collects price and value information associated with in-app purchases, but it does not collect this information when the user simply opens the app.<sup>81</sup> Through GA4F, Google “track[s] metrics such as user engagement or user behavior per screen.”<sup>82</sup>

<sup>78</sup> [GA4] *Automatically Collected Events*, Google Analytics Help, <https://support.google.com/analytics/answer/9234069?hl=en> (Last accessed March 13, 2023).

<sup>79</sup> [GA4] *Automatically Collected Events*, Google Analytics Help, <https://support.google.com/analytics/answer/9234069?hl=en> (Last accessed March 13, 2023); Answer ¶ 54-56; Google’s Resp. to Interrog. No. 1.

<sup>80</sup> In the 1990s computer scientist Phillip Hallam-Baker mis-spelled “referrer” as “referer” in a HTTP standards document, RFC 1945, and it stuck. See *HTTP Referer*, Wikipedia, [https://en.wikipedia.org/wiki/HTTP\\_referer](https://en.wikipedia.org/wiki/HTTP_referer) (Last accessed March 17, 2023).

<sup>81</sup> [GA4] *Automatically Collected Events*, Google Analytics Help, <https://support.google.com/analytics/answer/9234069?hl=en> (Last accessed March 13, 2023).

<sup>82</sup> *Measure Screenviews*, Google, [https://firebase.google.com/docs/analytics/screenviews#automatically\\_track\\_screens](https://firebase.google.com/docs/analytics/screenviews#automatically_track_screens) (Last accessed February 15, 2023).

92. Many of the events that Google automatically logs with GA4F, such as first opens and in-app purchases, are common conversion events. Conversion events are user activities that are considered important, and that developers and advertisers often seek to optimize. As explained by Belinda Langner, Google's 30(b)(6) designee and Product Manager for App Campaigns, "in the context of advertising" a conversion occurs when "a specific ad led to a specific action within the app," such as a "first open or [an] in-app purchase" (Langner Tr. 133:13-18; *see also* Ma Tr. 213:8-11).<sup>83</sup> Through GA4F, Google collects data that Google uses to track conversions driven by advertisers that place their ads with Google, and that Google serves through platforms like AdMob (Ganem Tr. 28:21-25).

93. Through GA4F, Google also automatically collects certain user properties. These include age, gender, interests, app version, operating system version, language, first launch time, and device model, and many other pieces of information (GOOG-RDGZ-00187017 at -018; Google's Resp. to Interrog. No. 1).

<sup>83</sup> *See also* Langner Tr. 133:20-23 ("advertisers are able to define their -- the app events that they care about, and so certainly, advertisers define other types of events").

94. Some of the events and user properties that GA4F automatically collects are shown in the figure below, which is excerpted from a 2016 document (GOOG-RDGZ-00195309 at -490).<sup>84</sup>

Automatic Events () {		Automatic User Properties () {	
first_open	notification_foreground	Age	App Version
in_app_purchase	notification_receive	Gender	Device Brand
user_engagement	notification_open	Interests	Device Model
session_start	notification_dismiss	Language	Device Category
app_update	dynamic_link_first_open	Country	OS Version
app_remove	dynamic_link_app_open	Lifetime Value	App Store
os_update	dynamic_link_app_update	First Open Time	
app_clear_data	firebase_campaign		
app_exception			
} ...more to come!		}	

95. Altogether, GA4F collects a surprising amount of data. According to documents Google produced in this case, GA4F can collect “up to 500 different event types,” with “25 parameters per event,” while simultaneously collecting detailed data about the user “such as Age, Gender, Interests, App Version, and OS Version” and potentially dozens more pieces of information (GOOG-RDGZ-00187017 at -018). GA4F can also “create up to 50 audiences by combining event data and user properties,” and track specific events designated as “conversions” (GOOG-RDGZ-00187017 at -018).

96. GA4F can be integrated with many other Google products, including Google AdMob, Google Play<sup>85</sup>, Google Ads, Firebase Cloud Messaging, and Firebase Crashlytics (GOOG-RDGZ-00050615 at -615). “Google Analytics has integrations with other products which may collect their

<sup>84</sup> See also GOOG-RDGZ-00028218 at -219 and -220. The document lists some of the automatically captured events by GA4F, including first\_open, in\_app\_purchase, error, user\_engagement, session\_start, app\_update, os\_update, app\_clear\_data, notification\_foreground, notification\_receive, notification\_open, notification\_dismiss. Some of the automatic user properties collected include app version, device model, interests, gender, age, OS version, app store, first open date and new/established. In addition to automatically logged events, GA4F can also log recommended events and custom events specified by app developers. *Log Events*, Google, <https://firebase.google.com/docs/analytics/events?platform=android> (Last accessed February 15, 2023).

<sup>85</sup> In Google’s Answer to Plaintiff’s Fourth Amended Complaint, “Google admits that Firebase SDK provides support for Google Play and that Google Play is a platform through which app developers can distribute their app to users and process payments” (Answer ¶ 41).

own data separately and log them to different log sources and where there are integrations between these products, it may be that certain data from one product then later flows into another product, which is the nature of integrations” (Ganem Tr. 53:7-14).

97. As I discussed above, Google uses GA4F to collect and save data relating to user activity within apps, either natively or within Webview. The events, parameters, and user properties that Google uses GA4F to collect and save in Webview are also extensive.

98. A Google help page summarizes the events that Google automatically collects and saves using GA4, which, as I explained previously, is the current generation of Google Analytics for apps and the web, built atop the GA4F architecture. These events are identified in the table below, and events denoted “web” are applicable in Webview<sup>86</sup>:

Event	Automatically triggered...
ad_click	when a user clicks an ad
ad_exposure	when at least one ad served by the Mobile Ads SDK is on screen
ad_impression	when a user sees an ad impression
ad_query	when an ad request is made by the Mobile Ads SDK
ad_reward	when a reward is granted by a rewarded ad served by the Mobile Ads SDK
adunit_exposure	when an ad unit served by the Mobile Ads SDK is on screen
app_clear_data	when the user resets/clears the app data, removing all settings and sign-in data Android only
app_exception	when the app crashes or throws an exception
app_remove	when an application package is removed (uninstalled) from an Android device Android only
app_store_refund	when an in-app purchase is refunded by Google Play Android only
app_store_subscription_cancel	when a paid subscription is cancelled in Google Play Android only
app_store_subscription_convert	when a free-trial subscription is converted to a paid subscription
app_store_subscription_renew	when a paid subscription is renewed
app_update	when the app is updated to a new version and launched again
click (web)	each time a user clicks a link that leads away from the current domain
dynamic_link_app_open	when the app is updated to a new version and is opened via a dynamic link Android only
dynamic_link_app_update	when the app is updated to a new version and is opened via a dynamic link Android only

<sup>86</sup> [GA4] Automatically Collected Events, Firebase Help, <https://support.google.com/firebase/answer/9234069> (Last accessed February 15, 2023).

Event	Automatically triggered...
dynamic link first open	when a user opens the app for the first time via a dynamic link
error	logged in place of an event that can't be logged because it is invalid in some way
file_download (web)	when a user clicks a link leading to a file
firebase_campaign	when the app is launched with campaign parameters
firebase_in_app_message_action	when a user takes action on a Firebase In-App Message
firebase_in_app_message_dismiss	when a user dismisses a Firebase In-App Message
firebase_in_app_message_impression	when a user sees a Firebase In-App Message
first_open	the first time a user launches an app after installing or re-installing it
first_visit	the first time a user visits a website or launches an Android instant app with Analytics enabled
form_start (web)	the first time a user interacts with a form in a session
form_submit (web)	when the user submits a form
in_app_purchase	when a user completes an in-app purchase, including an initial subscription, that is processed by the Apple App Store or Google Play Store
notification_dismiss	when a user dismisses a notification sent by Firebase Cloud Messaging (FCM) Android only
notification_foreground	when a notification sent by FCM is received while the app is in the foreground
notification_open	when a user opens a notification sent by FCM
notification_receive	when a notification sent by FCM is received by a device when the app is in the background Android only
notification_send	when a notification is sent by FCM Android only
os_update	when the device operating system is updated to a new version.
page_view (web)	each time the page loads or the browser history state is changed by the active site
screen_view	when a screen transition occurs
scroll (web)	the first time a user reaches the bottom of each page (i.e., when a 90% vertical depth becomes visible)
session_start	when a user engages the app or website
user_engagement	when the app is in the foreground or webpage is in focus for at least one second.
video_complete (web)	when the video ends
video_progress (web)	when the video progresses past 10%, 25%, 50%, and 75% duration time
video_start (web)	when the video starts playing
view_search_results (web)	each time a user performs a site search, indicated by the presence of a URL query parameter

99. With GA4F, Google also collects and saves user dimensions relating to users in native app and Webview, including sensitive user information such as age, gender, location, interests,

location, and device information. Automatically collected user dimensions are summarized in the table below, also based on a Google help page<sup>87</sup>:

User dimension	Description
Age	The age of the user by bracket: 18-24, 25-34, 35-44, 45-54, 55-64, and 65+.
App store	The store from which the app was downloaded and installed.
App version	The versionName (Android) or the Bundle version (iOS).
Browser (web)	The browser from which user activity originated.
City	The city from which user activity originated.
Continent	The continent from which user activity originated.
Country	The country from which user activity originated.
Device brand	The brand name of the mobile device (such as Motorola, LG, or Samsung).
Device category	The category of the mobile device (such as mobile or tablet).
Device model	The mobile device model name (such as iPhone 5s or SM-J500M).
Gender	The gender of the user (male or female).
Interests	The interests of the user (such as Arts & Entertainment, Games, Sports).
Language	The language setting of the device OS (such as en-us or pt-br).
New/Established	New: First opened the app within the last 7 days. Established: First opened the app more than 7 days ago.
Operating system	The operating system used by visitors to your website or mobile app.
OS version	The operating system version used by visitors to your website or mobile app (such as 9.3.2 or 5.1.1).
Platform	The platform on which your website or mobile app ran (such as web, iOS, or Android).
Region	The geographic region from which user activity originated.
Subcontinent	The subcontinent from which user activity originated.

a. Identifiers Used and Issued by Google

100. Google uses GA4F to collect and save a multitude of identifiers for specific events, apps, devices, and users, in addition to events and user properties.

101. One of the identifiers that Google collects and saves via GA4F is the GAIA ID, which is unique to the user's Google account. Google collects the user's GAIA ID regardless of their WAA or sWAA status; the user's WAA or sWAA status affects the locations and time for which data is saved alongside the GAIA ID. When the user has turned off WAA or sWAA, their data may still

<sup>87</sup> [GA4] *Predefined User Dimensions*, Firebase Help, <https://support.google.com/firebase/answer/9268042> (Last accessed February 15, 2023).

119. Based on documents that Google produced in this case, the testimony of Google's employees and Google itself (including through interrogatory responses and Google's 30(b)(6) designees), and my testing of Google's collection and saving of data related to apps that use these Google advertising products, it is my opinion that Google uses these app advertising products to collect and save app activity data even if the user has turned off their WAA or sWAA settings.

120. As with GA4F, Google checks the user's consent status on its servers, after collecting and saving the data. David Monsees, Google's 30(b)(6) designee and Product Manager in the Footprints team, explained that Google first collects and saves an ad request without knowing "if WAA was on or not" (Monsees Tr. 96:1-13). Google checks the user's WAA and sWAA status only after the ad request "hits the Google server" (Monsees Tr. 96:1-13). Google's internal documentation describing the "[l]ife of an ad request" confirms Mr. Monsees's understanding (GOOG-RDGZ-00028472 at -474). According to that document, a Google server called [REDACTED] "[h]andles all policy enforcement details" (i.e., works with other servers to check WAA and sWAA status) (GOOG-RDGZ-00028472 at -474). The ad request itself does not contain the user's WAA or sWAA setting states; Google must use an identifier to look up the user's status (Monsees Tr. 96:1-13, 101:24-102:4).

121. Like GA4F, Google uses its app advertising products to collect a wide variety of data, including events, parameters, and user properties.

122. The Google Mobile Ads SDK, for example, automatically sends data relating to several types of ad events. These include ad requests, in which an app that uses AdMob, Ad Manager, or AdSense asks Google for an ad to display; ad impressions, in which an ad is shown in an app; ad views, in which the user views an ad displayed in the app; and ad clicks, in which the user clicks on an ad. In Google's Answer, it admits that the Google Mobile Ads SDK collects "app-



interaction[]” data “such as ad clicks and ad impressions” (Answer ¶ 66). The collection and saving of an ad request are the first steps in Google’s process of delivering an ad—a large part of Google’s business model. If Google did not collect and save ad requests, it could not serve ads. And without data regarding both ad requests and the ads that Google served, Google would lack the records it needs to charge advertisers for its services.<sup>94</sup> Google also uses this ads data to track conversions; if it lacked data regarding a user’s interaction with an ad, it would be unable to determine whether that interaction is related to any later behavior.<sup>95</sup>

123. As with GA4F, Google uses the Google Mobile Ads SDK to collect and save this event data with substantial amounts of additional information. This information includes, but is not limited to, IP address, timestamp, device identifiers (including ADID and IDFA), information about the device (including location), and information about the ad content served (GOOG-RDGZ-00164383 at -387; GOOG-RDGZ-00206388 at -399).

124. The GMA SDK also sends other identifiers, such as the GAIA ID. As explained by internal Google documentation, “For Android devices...the AdMob SDK obtains the GAIA-ID for the default account signed into the device and creates a [REDACTED] which is passed with every AdMob ad request. For convenience of processing, the Gaia ID is passed in the same format as the DSID cookie” (GOOG-RDGZ-00147439 at -452). The GMA SDK also sends an AdMob app ID (admob\_app\_id), which identifies an AdMob app account (GOOG-RDGZ-00058520 at -520).

<sup>94</sup> E.g. *Click Measurement Guidelines* at 16, Interactive Advertising Bureau, <https://mediaratingcouncil.org/standards-and-guidelines> (Last accessed March 17, 2023) (discussing “auditing guidelines,” which include “counting methods”); *Mobile Application Advertising Measurement Guidelines* at 20, Interactive Advertising Bureau, <https://mediaratingcouncil.org/sites/default/files/Standards/Mobile%20InApp%20Measurement%20Guidelines%20%28MMTF%20Final%20v1.1%29.pdf> (Last accessed March 19, 2023) (same).

<sup>95</sup> E.g., GOOG-RDGZ-00195736 at -37 (describing [REDACTED] “conversion window[s]” for Google to connect the data).

WAA-on, sWAA-off; WAA-on, sWAA-on). The types of stored data are also the same regardless of these user settings.

202. Google's January 31, 2023 production of data from its GA4F collection log also shows that Google saves GA4F data in non-GAIA logs using substantially the same structure and content as the data it saves in non-GAIA logs. Because Google stores a copy of "consented data" in both GAIA and non-GAIA logs, the timestamps, identifiers, and data stored in both types of logs make GAIA and non-GAIA data and ID joining straightforward. This means that if a user had WAA on or sWAA on for a time during the class period, their WAA-on and sWAA-on data links their non-GAIA identifiers to their GAIA IDs. Effectively, linking GAIA ID to a single non-GAIA record containing ADID or IDFA links all of the user's data with the same ADID or IDFA to that GAIA ID. The same can be said about app instance id and any other Google identifier that uniquely identifies an instance of an app.

### **3. Google's Storage of WAA-off and sWAA-off App Ads Data**

#### **a. App Ads Data Logging**

203. Like with analytics data, data collected by way of Google's app ads products are stored in Google logs irrespective of the user's WAA or sWAA status. The WAA and sWAA settings affect only which Google identifiers are used, and where the data is saved.

204. As discussed in Section VII.A.2, when a user is signed into Google and has WAA or sWAA turned off, app ads data arrives at Google with both GAIA and non-GAIA identifiers. After the consent check, Google saves the data in long-term logs and the data may also be processed downstream through Google's ad stack.

205. Like analytics data, WAA and sWAA merely control whether app activity data from non-Google apps is stored with a user's GAIA ID in Google logs. Specifically, when WAA/sWAA is on, the data may be stored with a user's GAIA ID; when WAA/sWAA is off, the data is stored

with a user's non-GAIA IDs.<sup>136</sup> Google's Supplemental Response to Interrogatory No. 23 explains: "When a user is logged into their Google Account and has turned WAA and/or sWAA off, any data that is collected by the Google Mobile Ads SDK is logged against pseudonymous identifiers."

206. Google uses bits within ads logs to track the WAA and sWAA status of event-level data. Google's Supplemental Response to Interrogatory No. 17 explains: "Google identified a log called [REDACTED] that indicates WAA and sWAA status alongside ad interactions, e.g., views and clicks, on App Campaigns designated app-install campaigns." Google relatedly admitted in its Response to Request for Admission No. 25 that "[a]t least one Google log contains one or more bits and/or fields that reliably shows whether specific event-level traffic was generated while WAA was off." Therefore, not only is Google saving WAA-off and sWAA-off data to class members' Google Accounts (both before and after the consent check) Google also marks some of the data as WAA-off or sWAA-off.

207. On February 7, 2023, Google's counsel provided a list of "AdMob Logs" "identified through a reasonably diligent investigation of the logs AdMob may log ad interaction data to from devices used by users whose Google accounts may have had WAA or sWAA turned off at the time of the data was generated" (Feb. 6, 2023 Email from E. Santacana, Re: Rodriguez: Letter Brief on 9th Set of RFPs and Open Requests). This list of logs, shown below, includes both non-GAIA logs and personal logs. My understanding, based on reviewing Google's internal documentation, is that personal logs contain users' GAIA IDs (GOOG-RDGZ-00185868). Furthermore, Google's

<sup>136</sup> Google states in Section 3 its Third Supplemental Response to Interrogatory No. 1, titled Consent Checks and Technical Barriers to Joining, that "[e]ach of WAA, sWAA, GAP, and NAC are account-level Web & App Activity and Ads Personalization controls. If sWAA, GAP, and NAC are all turned on, the result of the consent check is that the data can be tied to a user's Google account in what is known as 'GAIA space.' If any of these controls are off, then the data isn't joined to a user's Google account, and therefore not logged in 'GAIA space.'"

269. Based on my experience with computing systems and my knowledge of data management and the advertising business, it also is my opinion that Google's collection and saving of WAA-off and sWAA-off Data does not result in any material incremental costs to Google's business. WAA-off and sWAA-off Data constitutes a relatively small portion of traffic compared to WAA-on and sWAA-on Data. Therefore, Google's collection and saving of WAA-off and sWAA-off (or Google's lack of doing so) has no material impact on Google's planning and budgeting for infrastructure, including physical space, data warehouse capacity, personnel, and marketing.

#### **1. Serving Advertisements While WAA or sWAA Is Turned Off**

270. As discussed earlier on Section VII.A.1., on Publisher apps, ads are served through the Google Mobile Ads SDK. In Google's Answer to Plaintiff's Fourth Amended Complaint, "Google admits that AdMob is a Google product that app developers may use to monetize mobile apps with targeted, in-app advertising" (Answer ¶ 60) and "Google admits that Google AdSense and Ad Manager are products that help a user sell products on a non-Google website or app" (Answer ¶ 70).

271. Advertisements shown to users when WAA or sWAA is turned off rely on Google's collection and saving of WAA-off or sWAA-off data. Put differently, but for Google's collection of WAA-off or sWAA-off data, Google would not be able to serve advertisements to those users and then charge the advertisers because Google would lack the necessary data records to back up their advertising charges.

272. As discussed above, Google's GMA SDK sends an ad request message to Google servers when a user views a page in an app containing a slot for an ad. This process occurs regardless of whether WAA and/or sWAA are on or off (Google's Supp. Resp. to Interrog. No. 23). If WAA and sWAA controlled Google's collection of this information by way of the GMA SDK, then Google would not return the requested ad to the publisher's app. Relatedly, as explained in more

278. Ad personalization is impacted by two additional user controls: GAP (GAIA Ads Personalization) and NAC (New Ads Control).<sup>153</sup> Because Google does not use data collected by GA4F from WAA- and sWAA-off users to serve personalized ads, such WAA- and sWAA-off data is not used for ads personalization regardless of whether GAP and NAC are turned on or off. A WAA/sWAA-off user's GAP and NAC settings influence only whether Google serves ads that are personalized based on other data sources. "[A] user with 'GAP on AND (WAA-off OR sWAA-off ...)' still has appreciably greater monetization potential than a user with 'GAP off'" because a GAP-on, WAA/sWAA-off user "is eligible for a subset of personalization scenarios (such as Customer Match)" that "does not include any audience targeting based on profiles generated from persisted activity data." GOOG-RDGZ-00042152.R at -156.R. Moreover, even where WAA and sWAA are off, Google can (provided GAP is on) serve personalized ads using data collected from when the user had WAA or sWAA turned on.

## **2. Attribution/Conversion Tracking**

279. Google also uses WAA- and sWAA-off data to track and model advertising conversions. Conversions track how users respond to prompts, including advertisements. As explained by Google employee and 30(b)(6) witness Belinda Langner: "When we talk about conversion in the context of advertising, it is . . . whether or not a specific ad led to a specific action within the app and those actions can include things such as the first open or the in-app purchase" (Langner Tr. 133:13-23). As explained by Google employee Steve Ganem during his deposition: "On the Analytics side . . . a customer can indicate which events are conversions for them. For example, a

<sup>153</sup> Both GAP and NAC settings are found under "Manage your Google Account" settings -> Data & Privacy -> Ads Settings. The "Ad personalization is on" slider is the GAP control and the "Also use your activity & Information..." check box is the NAC control.

purchase might be a common conversion for them. And when there is an occurrence of that event, that is marked as a conversion” (Ganem Tr, 269:20-270:2).

280. The ability to capture conversion events, as well as the ability to attribute a conversion event to a prior ad event, allows Google to demonstrate the effectiveness of its advertising platforms to the advertisers, which in turn, increases advertiser spend on Google advertising platforms.<sup>154</sup> But for Google’s collection and saving of WAA-off or sWAA-off data, Google would not be able to attribute conversions to events (like ad clicks) that occur when WAA or sWAA is off.

281. Two attributions scenarios are relevant for this case when a user is signed into their Google account and has WAA or sWAA turned off.

- **Scenario 1:** When an ad is served through the GMA SDK (for AdMob or Ad Manager) in a 3P publisher app, Google’s ability to connect this ad with a later conversion event like a purchase (on web or app) relies on Google’s collection of app ads data (i.e., ad impressions, clicks, and similar data) via the GMA SDK, and the saving of this data in its logs for later attribution. If the publisher app also uses GA4F, the collected analytics data may be used as well.
- **Scenario 2:** When an ad is served elsewhere (e.g., on google.com, youtube.com, 3P websites, or a Google app), Google’s ability to connect this ad with a later conversion event in a 3P app implementing GA4F relies on Google’s collection of app analytics data via the GA4F SDK, and the saving of this data in its logs and data storage for later attribution.

282. Thus, Scenario 1 relies on Google’s collection and saving of WAA- and sWAA-off data from publisher apps implementing the GMA SDK (and GA4F if available). Scenario 2 relies on Google’s collection and saving of WAA- and sWAA-off data from advertiser apps that use GA4F. Some studies have reported a 10% - 20% performance uplift when advertising platforms are

<sup>154</sup> “[W]e do conversion measurement as a way to show the value that the Google app campaigns have brought to a specific advertiser” (Langner Tr. 215:11-14). This is true even when sWAA is turned off (Langner Tr. 215:15-218:4).

integrated with GA4F (GOOG-RDGZ-00196222 at -244). If Google stopped collecting and saving WAA/sWAA-off data from users' activities on non-Google apps, both attribution scenarios would fail.

283. For example, for App Campaigns,<sup>155</sup> also known as "App Promo," advertisements promoting apps can be run on websites and in apps, including in apps that use the GMA SDK.<sup>156</sup> "App campaigns can show ads across the various different Google properties and Google's ad networks. App campaigns can show an advertiser's app promotion ad within search or what we would call Google.com" (Langner Tr. 161:17-22).

284. In a particular scenario where an app ad click led to a conversion event in a different app, Ms. Langner explained the conversion attribution flow as follows: "The Google Ads systems can choose to display an ad to a specific user like we talked about within an app, okay? That user can then click on that ad. That information is all logged. When a user then is taken to the App Store, downloads the app and then opens the app for the first time, Google Analytics for Firebase may send a first open event assuming a number of the conditions that we talked about, right, including the fact that . . . Google has to do something called an attribution so we have to confirm on the ad side that this specific device, IDFA or Ad ID, was shown the ad and then the attribution happens on that specific conversion event" (Langner Tr. 156:14-157:10).

<sup>155</sup> "[A]pp campaigns is an ad campaign type, right, that allows advertisers to promote their app, their mobile app" (Langner Tr. 109:11-14). See Appendix E for a discussion of other types of advertising campaigns.

<sup>156</sup> "So AdMob, right, shows ads that allow advertisers who want to promote their app, right, and there are also advertisers that want to promote their website" (Langner Tr. 111:22-112:1) and "So app campaigns, right, are -- are campaigns where an advertiser can promote their mobile app, right, and they -- and through this, advertisers can specify the specific app conversion that they want to drive towards. These types of events can include things that I mentioned earlier such as first open and in-app purchases. Google then decides to show those advertisements promoting that advertiser's mobile app on various different properties and the Google ad -- and the Google ad networks that we -- we have, including AdMob, as we had mentioned" (Langner Tr. 118:23-119:13). Google . . . chooses to optimize to find the right users who may be more likely or have a higher propensity to perform those specific actions that the advertisers specified" (Langner Tr. 151:2-152:5).

285. Ms. Langner also testified about the role played by GA4F for conversion tracking, particularly for App Campaigns. “Google app campaigns use[] app conversions for reporting to advertisers in our app campaigns,” (Langner Tr. 25:16-18) and “GA analytics for Firebase, GA4F, specifically collects app conversions and so that is specifically relevant for advertisers who are promoting their app” (Langner Tr. 112:5-9). GA4F is used to “collect data, specifically app conversion data, and that includes certainly first opens, right, so when a user first opens, or in-app purchases or other specific events that a developer would -- would define in Google Analytics for Firebase” (Langner Tr. 113:19-114:1). “[W]hen it comes to the Google Analytics for Firebase data, all of the conversions that happen within a specific app and are collected by Google Analytics . . . . App conversion data can be used then, right, by the Google Ads systems and so -- and -- and that’s primarily used by app campaigns” (Langner Tr. 147:24-148:7).

286. In written discovery, Google has separately admitted that it tracks conversions for app campaigns (i.e., App Promo) by way of GA4F. [REDACTED]

[REDACTED]” (Google’s Supp. Resp. to Interrog. No. 17). [REDACTED]

287. Ms. Langner also explained that Google uses non-GAIA identifiers to track conversions. “Specifically for Firebase conversions, Google uses pseudonymous identifiers, such as IDFA or ADID for the purposes of conversion measurement” (Langner Tr. 32:10-13). “For Google Analytics for Firebase data, when the user has sWAA-off, the Google Ads systems can use data in this pseudonymous space for the purposes of conversion measurement” (Langner Tr. 185:13-17). Mr. Ganem, another 30(b)(6) witness, provided similar testimony. In response to a question about whether Google uses IDFA and ADID for conversion tracking, Steve Ganem responded, “Yes, it



does” (Ganem Tr. 251:13). Mr. Ganem continued: “Yes, for example, when a user clicks on an ad, say, from another ad network, and the IDFA and ADID are collected, and they eventually convert. . . . [A]ssuming that the IDs are available, then Google Analytics will do a match between them and match the conversion to the click” (Ganem Tr. 251:20-25, 252:5-8) (describing how, if “ADID and IDFA are available, [Google] would do a Device ID-based conversion measurement”).

288. Ms. Langner also described how Google ultimately benefits from its ability to track conversions. “In the context of ads, advertisers are able to target for users who are more likely to do a specific event . . . and Google makes money by driving more -- through the ad impressions and the ad clicks that we drive to -- to help app advertisers reach their marketing goals” (Langner Tr. 213:15-23). “The app campaigns will try to find more users that are likely to perform those actions, and advertisers specify specific target that they would like to pay for every single action and Google tries to optimize towards those targets. So by driving -- by basically, you know, advertisers, when we reach their goals, you know, may -- and reach their ROI goals may -- may choose to adjust their budgets accordingly with -- with Google and the Google Ads systems” (Langner Tr. 214:10-215:1).

289. Steven Ganem provided similar testimony. “in the event proto, there’s - sort of the event proto tab, there’s an indication, for example, of the event name. And if that was an event that the customer had marked as a conversion, then there would be an -- basically, we would know that that is an event that the customer deems important” (Ganem Tr. 270:15-20).

290. Google’s trillion-dollar advertising engine relies on ad performance measurements that report to advertisers how effective their ads have been and prove that Google’s ads meet industry standards for traffic quality.

291. In its response to Request for Admission No. 37, Google denied using WAA-off data to track, model, or measure conversions that occur across Google and non-Google properties, but other discovery contradicts that assertion. For example, in Response to Interrogatory No. 15, which asked about “how Google currently uses and previously . . . has used WAA-off Data,” Google admitted that Google uses WAA- and sWAA-off data for “pseudonymous conversion tracking.” Google’s Supplemental Response to Interrogatory No. 15 further explains: “DeviceID-keyed advertising interactions with an advertiser, such as views and clicks of that advertiser’s ads, are joined to conversions recorded in that advertiser’s app using Firebase (or other third party conversion tracking products or services).” Google tracks “when the same device that interacted with [an advertiser’s] ad subsequently converted (e.g., opened their app, or made an in-app purchase, depending on how the advertiser has defined a conversion for the ad campaign).”

292. That interrogatory response cannot be reconciled with Google’s response to Request for Admission No. 37, where Google denied that it “has used WAA-Off Data to track, model, or measure conversions that occur across Google and non-Google properties.” If Google attributes a WAA/sWAA-off user’s interaction with an advertisement in one place to the user subsequently opening that advertiser’s app and/or making a purchase, then Google tracks, models, or measures conversions that occur across Google and non-Google properties.

293. Google employee Belinda Langner discussed how device-level controls available to users (i.e., LAT ATT, and OOOAP, which I discussed in Section VII.A.1) affect how Google tracks conversions.

294. But any impact to Google’s ability to track and model conversions is offset by several mitigating measures. For IDFA specifically, an internal Google document explains that data generated by LAT-disabled users are “used to model conversions for LAT-enabled users” (GOOG-

RDGZ-00197928 at -930). “Modeling” is what it sounds like. For example, Google “[u]se[s] linked data as truth set to model conversions that we think are driven by a Google Ad interaction . . . . We don’t associate a click with a conversion; we only guess which set of conversions are driven by our ads” (GOOG-RDGZ-00056108 at -116).

295. Google also implemented conversion modeling for iOS14.5, “serving on all zero IDFA traffic across all stacks” (GOOG-RDGZ-00197101 at -106). Google explains that “conversions whose ads originate on ATT impacted traffic will experience modeling” (GOOG-RDGZ-00142709 at -710). One such conversion modeling algorithm is a machine learning algorithm called iDog for iOS; the “beta launched in early July 2018” (GOOG-RDGZ-00193001 at -005). Other conversion modeling projects are discussed in Appendix E. Appendix E also discusses Google’s implementation of an aggregated ID called GBRAID ID (Google Broad Ad ID<sup>157</sup>), which Google used in response to ATT for aggregate conversion tracking.

296. Moreover, advertisers can opt out of running ads campaigns against “LAT-enabled inventory” (GOOG-RDGZ-00197928 at -931). As for Android, the loss of ADID is “limited to loss of measurability for view-through based conversions (EVCs and VTCs), as well as losses due to undetected IVT [invalid traffic<sup>158</sup>] traffic” (GOOG-RDGZ-00208099 at -105). Contextual Advertising and frequency capping (limiting the number of times an advertisement is shown to the same user) are not impacted by ADID (GOOG-RDGZ-00208099 at -103).

### **3. Improving Google Products, Processes and Services**

297. Aside from using WAA-off and sWAA-off data for serving advertisements and tracking conversions, Google also used WAA-off and sWAA-off data for product development, improvement, and diagnostics. Google’s 4th Supplemental Response to Interrogatory No. 1,

<sup>157</sup> GOOG-RDGZ-00178406 at -407

<sup>158</sup> GOOG-RDGZ-00189134 at -139

# Appendix A-12

## Appendix E

### Ad Campaigns and Conversion Tracking/Modeling

#### Table of Contents

1	Types of Ad Campaigns.....	1
1.1	App Campaigns (App Promo) .....	1
1.2	Other Types of Ad Campaigns .....	4
2	Conversion Tracking/Modeling and Attribution Overview.....	6
2.1	Conversion and Attribution.....	6
2.2	Bidding.....	9
2.3	Conversion Modeling.....	13

## 1 Types of Ad Campaigns

1. Non-Google apps use Google’s advertising platforms called Google Ads (formerly known as Google AdWords<sup>1</sup>) and/or Display & Video 360 (formerly known as DoubleClick Bid Manager<sup>2</sup>) to manage their advertising campaigns. A non-Google app developer can specify a few different types of ad campaigns, including but not limited to App, Search, Display, and Video.<sup>3</sup>

### 1.1 App Campaigns (App Promo)

2. An App Campaign (also called “app promotion” or “app promo” campaign) has three options that advertisers can select from<sup>4</sup>:

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<sup>1</sup> “Google Ads Rebrand for AdWords, as of August 2018” (GOOG-RDGZ-00193001 at -004).

<sup>2</sup> “We’ve unified our DoubleClick advertiser products and the Google Analytics 360 Suite under a single brand: Google Marketing Platform. As part of the launch of Google Marketing Platform on July 24, 2018, the following changes occurred to DoubleClick Digital Marketing products: DoubleClick Bid Manager is now Display & Video 360, a product that brings together planning, creative, buying, and measurement features into a single tool.” *Introducing Google Marketing Platform*, Campaign Manager 360 Help, <https://support.google.com/campaignmanager/answer/9015629?hl=en> (Last accessed March 15, 2023).

<sup>3</sup> *Choose the Right Campaign Type*, Google Ads Help, <https://support.google.com/google-ads/answer/2567043> (Last accessed March 15, 2023).

<sup>4</sup> *About App Campaigns*, Google Ads Help, <https://support.google.com/google-ads/answer/6247380> (Last accessed March 15, 2023).

- App Installs – run ads that encourage users to install an app. A user clicking on the ad is taken to an app store to install the app. Such ad campaigns are called App Campaigns for Installs (ACi) (GOOG-RDGZ-00056514 at -517).
- App Engagement – show ads to users who have already installed an app. App engagement ads encourage users to come back to a specific part of the app to make a purchase, book a flight, etc. Such ad campaigns are called App Campaigns for Engagement (ACe) (GOOG-RDGZ-00056514 at -517). App developers configure what are called “deep links,” which “send mobile device users directly to relevant pages in [an] app rather than [a] website.”<sup>5</sup>
- App Pre-registration (Android only) – run ads for apps before they are released on Google Play. These ads generate user’s interest in an app that has not been released. “Before an [] app is released on the Google Play Store, users have the option to pre-register for [the] app or game. On the first day of launch, users receive a notification to install the app” (GOOG-RDGZ-00194335 at -395). App pre-registration was beta tested in 2019 and launched in 2020 (GOOG-RDGZ-00067938 at -940).

3. App Campaign ads can “appear across Google’s properties. This includes Google Search, Google Play, YouTube, the Google Display Network, AdMob, Discover on Google Search, [Google’s] search partners, and many more publishers who host app ads.”<sup>6</sup> Within apps, App Campaign ads can be served by the Google Mobile Ads SDK (which supports AdMob and Ad Manager).

4. App Campaigns were previously called Universal App Campaigns (UAC). Google renamed UAC to App Campaigns in February 2019.<sup>7</sup> UAC itself was launched in 2015. At that time, UAC campaigns “allow[ed] an AW [AdWords] app advertiser to run one simple campaign across 5 channels: Google Play, Search (Google.com), AdMob, mGDN [mobile Google Display Network] & YouTube” (GOOG-RDGZ-00081274 at -275). UAC Campaigns and its successor, App Campaigns, “use[] machine learning to make the smartest decision for each ad, analyzing

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<sup>5</sup> *About Deep Links*, Google Ads Help, <https://support.google.com/google-ads/answer/10023042> (Last accessed March 15, 2023). ACe falls back to the app store if the app is not actually installed, although Google clarifies that “[t]his is an edge case, since we try to avoid serving ACe campaigns to users who don’t have the app installed” (GOOG-RDGZ-00056514 at -517).

<sup>6</sup> *About App Campaigns*, Google Ads Help, <https://support.google.com/google-ads/answer/6247380> (Last accessed March 15, 2023).

<sup>7</sup> *Universal App Campaigns Are Now Simply App Campaigns*, Google Ads Help, <https://support.google.com/google-ads/answer/9256714> (Last accessed March 15, 2023).

hundreds of millions of potential signal combinations in real time” to serve app ads across “Google Play, Google.com, YouTube and the millions of sites and apps in the Display Network” GOOG-RDGZ-00081274 at -275.<sup>8</sup> As Google explained to app developers, “Universal App Campaigns is combining rich data about user actions, intent and context with smart machine learning to show your ads to the right person in the moments that matter...Machine Learning is UAC’s underlying source of success combined with data and Google’s distribution channels” (GOOG-RDGZ-00195309 at -508). With UAC, Google dynamically generates ads as well as bid price to reach app developers’ cost-per-install (CPI) targets (also called target cost-per-install tCPI).<sup>9</sup>

5. While UAC initially focused on app installs to encourage new users to try an app (App Campaigns for Installs (ACi) or formerly just as UAC (GOOG-RDGZ-00182145 at -145)), Google later added App Campaigns for Engagement (ACe) (also referred to as UACe) (GOOG-RDGZ-00193001 at -006) to encourage existing app users to come back to an app that is already installed. Google fully launched ACe towards the end of 2020 after beta testing. Google required app developers to implement app conversion<sup>10</sup> tracking and deep linking, and to have a minimum of 250,000 app installs.<sup>11</sup> To run ACe campaigns, “Advertisers upload a pre-defined audience (user-lists of device IDs), set a tCPA [target Cost per Action] for a specific action (e.g. app open, or virtual good purchase) and upload a set of creative assets. ACe then optimizes across all inventory channels to delivery maximum conversions at the target CPA...ACe’s bidding is 100% driven by

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<sup>8</sup> Sissie Hsiao, *Propel Your Mobile App Growth With Universal App Campaigns*, Google Ads, <https://www.blog.google/products/ads/propel-your-mobile-app-growth-wi/> (Last accessed March 15, 2023).

<sup>9</sup> Ginny Marvin, *Google’s New Universal App Campaigns Push App Promotions Across Search, YouTube, AdMob, Display*, Search Engine Land, <https://searchengineland.com/google-adwords-universal-app-campaigns-push-ads-221813> (Last accessed March 15, 2023). GOOG-RDGZ-00195309 at -534 discusses auto-generated video ads. GOOG-RDGZ-00196620 at -627 discusses auto-generated image ads.

<sup>10</sup> A conversion event is an advertiser defined metric that is important to their business. For example, app install and purchase within an app can be conversion events. Google keeps tracks of these conversion events and later makes the connection between a conversion event and a prior ad view or ad click in a process called “attribution.”

<sup>11</sup> *App Campaigns For Engagement Now Available For Eligible Advertisers Globally*, Google Ads Help, <https://support.google.com/google-ads/answer/10287275> (Last accessed March 15, 2023).

Machine Learning...ACe will look across Search, AdMob, YouTube, and Play for users relevant to the inputted business goals” (GOOG-RDGZ-00204430 at -434 and -435).

6. Google tracks “app installs and in-app events in Google Ads” using GA4F (GOOG-RDGZ-00201148 at -160). Google explained to app developers in 2016 that “UAC will work seamlessly with Firebase Analytics ... and continue to integrate with the top 3rd party app SDK’s. We’re especially excited about Firebase as it provides prebuilt engagement and in-app actions that will help you manage your conversions. And when you funnel these conversions into Adwords - UAC will automatically optimize to them. So, for app developers who want to find those users most likely to take meaningful actions, like reach level ten of their game, purchase that new camera, or book a vacation we’ve made it easier than ever” (GOOG-RDGZ-00195309 at -493).

## 1.2 Other Types of Ad Campaigns

7. Aside from App Campaigns, Google Ads and Display & Video 360 (DV360) also support other types of ad campaigns, including Search, Display, and Video.<sup>12</sup> Search campaigns run ads on search results pages across Google.com and Google’s search network<sup>13</sup> to show ads to people searching for a particular product or service. Display campaigns run ads across websites and apps as users browse websites and mobile apps.<sup>14</sup> Video campaigns run videos ads across YouTube and other websites and apps running on Google video partners.<sup>15</sup>

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<sup>12</sup> *Choose the Right Campaign Type*, Google Ads Help, <https://support.google.com/google-ads/answer/2567043> (Last accessed March 15, 2023).

<sup>13</sup> Google explains that “[t]he Google Search Network is a group of search-related websites and apps where your ads can appear. When you advertise on the Google Search Network, your ad can show near search results when someone searches with terms related to one of your keywords.” *About the Google Search Network*, Google Ads Help, <https://support.google.com/google-ads/answer/1722047> (Last accessed March 15, 2023).

<sup>14</sup> Google explains that “Display campaigns serve visually engaging ads on the Google Display Network. The Display Network helps you reach people as they browse millions of websites, apps, and Google-owned properties (such as YouTube and Gmail).” *About Display Ads and the Google Display*, Google Ads Help, <https://support.google.com/google-ads/answer/2404190> (Last accessed March 15, 2023).

<sup>15</sup> *About Video Campaigns*, Google Ads Help, <https://support.google.com/google-ads/answer/6340491> (Last accessed March 15, 2023).



8. Users interacting with Search, Display, and Video ads can later perform a conversion action either on an advertiser's app or website. Appify (externally called "App Deep Linking" (GOOG-RDGZ-00198933 at -938)) is a Google technology layer that enables ads shown under these types of ad campaigns to "deep-link into apps using URLs. This is a strategically important way to drive app conversions and therefore part of the app attribution story. App conversion tracking is complex since conversions can occur either on an app's mobile website (no deep link) or in the app itself (Appify deep link). Appify works when an advertiser sets up app links (Android, iOS). When app links are set up, mobile users who click on an ad with a URL landing page are not promoted to choose how to open the link but are instead taken directly to the advertiser's app. Mobile users who don't have the advertiser's app installed and users on Desktop are directed to the advertiser's website" (GOOG-RDGZ-00056514 at -518). Appify was launched by June 2019, with open beta launched earlier (GOOG-RDGZ-00198033 at -034 and -036).<sup>16</sup> Google later referred to Appify as Web to App Connect (W2AC) (GOOG-RDGZ-00202401 at -408).<sup>17</sup>

9. While both ACe and Appify may lead a user to apps, Appify is different from ACe. As Google explains, "ACe is a dedicated App Campaign type which re-engages app users by targeting audience lists of existing app users" whereas "Appify applies to existing Search, Display and Shopping (web) campaigns, and directs users to the app if the user already has the app...For ACe,

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<sup>16</sup> See also GOOG-RDGZ-00202401 at -424 ("Last year at Google Marketing Live, we announced app deep linking from Search, Display and Shopping ads. In the coming months, we'll be rolling out deep linking from YouTube, Hotel, Gmail and Discovery ads. On average, deep linked ad experiences drive 2X the conversion rates."); Prabhakar Raghavan, *Google Marketing Live: Building for the New Consumer Journey*, Google Ads & Commerce Blog, <https://blog.google/products/ads/new-ad-innovations-new-consumer-journey/> (Last accessed March 17, 2023) ("over the next few weeks, we'll enable app deep linking from Google Ads and offer more robust reporting across web and apps. Your app users will be taken directly from your Search, Display and Shopping ads directly to the relevant page in your mobile app, if they have your app already installed."); Allison Schiff, *Google Is Doubling Down On Deep Linking*, AdExchanger, <https://www.adexchanger.com/mobile/google-is-doubling-down-on-deep-linking/> (Last accessed March 17, 2023) ("Google bolstered its deep linking offering on Wednesday by enabling from YouTube ads, Hotel ads, Gmail ads and ads in Discovery, which is the main section of the Google app. Previously, it had only been available in search, display and Shopping ads.").

<sup>17</sup> Firebase Dynamic Links is not supported by Web to App Connect. "Web to App Connect (fka Appify)...only support App Links (Android) and Universal Links (iOS)" (GOOG-RDGZ-00201684 at -745).

all traffic is directed into apps, whereas for campaigns with Appify, a large portion of the traffic will continue to be sent to websites” (GOOG-RDGZ-00202401 at -516).

10. By 2019, “the Google Analytics for Firebase (GA4F) SDK ... [was made] mandatory for the next generation of UAC/UACe/Appify features” (GOOG-RDGZ-00054819 at -821).

## 2 Conversion Tracking/Modeling and Attribution Overview

11. Google demonstrates the effectiveness of its advertising platforms to advertisers through the ability to track conversion events as well as the ability to attribute that conversion event to a prior ad interaction event. The data collected allows Google to develop machine learning algorithms to determine the optimal bid price and to model conversions when conversion tracking is unavailable. These are discussed in more detail in this section.

### 2.1 Conversion and Attribution

12. There are three types of conversions: Click-through-conversions (based on ad click), Video engagements (when a user watches a video for more than 10 seconds), and View-through-conversions (based on a viewable ad impression) (GOOG-RDGZ-00056514 at -518).

13. Within non-Google mobile apps, Google tracks conversion events through Firebase, which is designed to track individual events. This is contrasted with older Google Analytics products that track conversions based on browsing sessions. As explained by Google, “[h]istorically, Google Analytics for websites had a sessions-based data model where conversions were defined as ‘did this session convert’ rather than ‘did a conversion happen’, whereas AWCT [AdWords Conversion Tracking] and Floodlight had a much simpler ‘event-based’ data model that directly spoke to ‘did a conversion happen’. This was addressed head on with Google Analytics for Firebase (GA4F), which moved to an event-based data model for app analytics and conversion tracking so that it also answered ‘did a conversion happen’. This was a major contributing factor to AWCT for apps

being deprecated and replaced by GA4F. Google Analytics '[REDACTED]' is the expansion of GA4F such that it will replace all of Google Analytics classic. The result is that all Analytics for web, app, and hybrids will leverage the event-based model going forward" (GOOG-RDGZ-00054819 at -821).

14. "Since 2016, Google Analytics for Firebase users [in this context, app developers] have been able to link their Firebase app with their corresponding Play app to allow Play data (e.g. IAP [in-app-purchase] events) to flow into their Firebase project. This integration has enabled users to track IAP conversions for AdWords and DoubleClick, add another metric for segmenting audiences and LTV, and much more" (GOOG-RDGZ-00194335 at -423).

15. Conversion events may also be tracked by Google's App Attribution Partners (AAPs).<sup>18</sup> "Developers tracking conversions using AAP SDKs wouldn't go through Google Analytics but can still notify Google Ads when conversions happen. Google ads reporting currently supports conversion imports from FiB [Bidding on Firebase]<sup>19</sup>, Google Play, and a variety of AAPs...However, advertisers will need to use the Firebase SDK if they want to employ automated bidding in Google Ads" (GOOG-RDGZ-00056514 at -517).

16. To complete ad performance measurement, an attribution process is implemented to determine which prior user ad interaction led to a conversion event.<sup>20</sup> "App attribution is a bit different from web attribution. In place of cookies or image pixel tags are SDK identifiers, advertising IDs, referrers [Android only], click data, and other information. Since users engage with apps over a period of time, there's also added emphasis on lifetime value when it comes to app attribution" (GOOG-RDGZ-00056514 at -514).

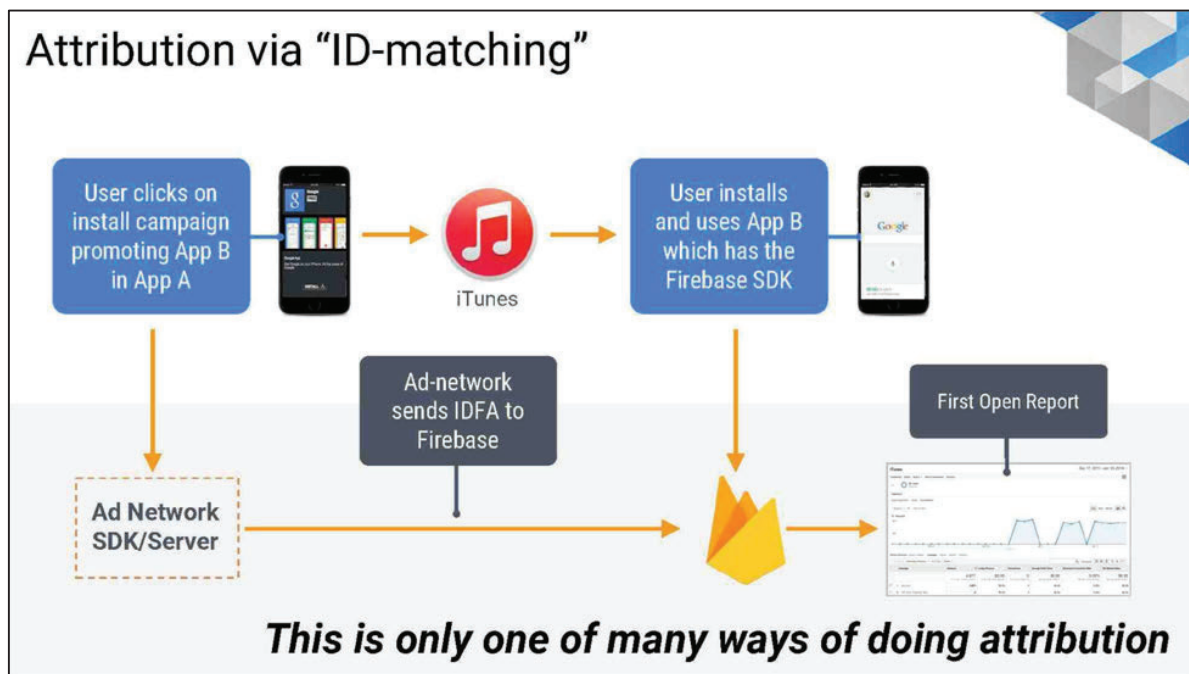
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<sup>18</sup> "The App Attribution Partner (AAP) Program is a formal partnership program between 3rd party app tracking providers and Google to measure the performance of app campaigns in AdWords" (GOOG-RDGZ-00193001 at -004).

<sup>19</sup> GOOG-RDGZ-00198985 titled "Appify – Bidding on Firebase Conversions – PRD" and go/fib-conversions-bidding-prd.

<sup>20</sup> Google applies machine learning to determine attribution with what is called Data-driven attribution (DDA) (GOOG-RDGZ-00056514 at -518).

17. One way for doing attribution is shown in GOOG-RDGZ-00061704 at -723, reproduced in the figure below. This particular attribution flow relies on device IDs (in this case, IDFA) to match an ad click to a conversion event tracked by GA4F. As noted in the figure below, this is only one of many ways Google performs attribution.



18. When devices IDs are not available, conversion tracking/attribution may be enabled using GCLID (Google Click ID). "Firebase sdk can extract the gclid using two ways – Deeplink click url for Appify/ACe" and "Play Referrer API for ACi" (GOOG-RDGZ-00177322 at -322).

19. When both device ID and GCLID are not available (for example, with Apple's App Tracking Transparency in iOS14), Google implemented an aggregated ID called GBRAID ID (Google Broad Ad ID (GOOG-RDGZ-00178406 at -407)), which is passed from deeplink URLs to Gold and Ads for Appify (GOOG-RDGZ-00054816 at -818; GOOG-RDGZ-00187249 at -264). Google explains that "[i]nstead of using gclid which is used to tie back the conversion to a click (and thus a user), Ads will be using an aggregated ID (CampaignID / AdgroupID) which generally

maps to multiple users. As a result, we do not know which user has converted but we would still be able to measure the number of conversions that occurred at the aggregate level. SDK stores GBRAID as user property and sends it for each conversion. Besides sending GBRAID to App Ads along with conversions in the BOW ping, Attribution unpacks GBRAID and matches it to random clicks with the same cohort. Thresholding will be applied to make sure a conversion is dropped if the number of clicks from the GBRAID on that date is too few” (GOOG-RDGZ-00177752 at -755 to -756).

## 2.2 Bidding

20. When an ad slot becomes available as a user browses a website or an app, multiple advertisers will compete to have their ad shown to the user. The advertiser’s ad that gets shown is determined through a bidding process where advertisers submit their interest for the ad slot as well as a bid price. There are several different bidding strategies depending on the type of ad campaign and the advertiser’s goal, including maximizing the number of clicks, impressions, conversions or views.<sup>21</sup> For example, if an advertiser wants to maximize the number of app installs or in-app events, they may choose to maximize conversions using Google’s Smart Bidding, available since mid-2016.<sup>22</sup> Advertisers have the choice to optimize several metrics, including target cost-per-install (tCPI) or target cost-per-action (tCPA).<sup>23</sup> In addition, Google launched Target Return on Ad Spend (tROAS) (equal to a user’s lifetime value (LTV), which measures the value of the user

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<sup>21</sup> *Understanding Bidding Basics*, Google Ads Help, <https://support.google.com/google-ads/answer/2459326> (Last accessed March 15, 2023).

<sup>22</sup> Anthony Chavez, *Get More Powerful Bids Automation With New AdWords Smart Bidding*, Google Ads & Commerce Blog, <https://www.blog.google/products/ads/more-powerful-bid-automation-with-smart-bidding/> (Last accessed March 15, 2023).

<sup>23</sup> “Smart Bidding refers to bid strategies that use machine learning to optimize for conversions or conversion value in each and every auction—a feature known as ‘auction-time bidding’. Target CPA, Target ROAS, Maximize conversions, and Maximize conversion value are all Smart Bidding strategies.” *About Smart Bidding*, Google Ads Help, <https://support.google.com/google-ads/answer/7065882?hl=en> (Last accessed March 15, 2023).



to an app / Cost) (GOOG-RDGZ-00066625 at -633) in 2019.<sup>24</sup> Google explains to app developers that “Google Ads Smart Bidding and Smart Creative solutions use machine learning that analyzes millions of signals in real time to show the right message to the right customer in the moments that matter. So instead of having to spend time manually optimizing your ads or bidding, you can get better results faster with the help of automated solutions.”<sup>25</sup> Google further explains to app developers, “Smart Bidding is a set of automated bidding strategies that use machine learning to optimize for conversions or conversion value. Smart Bidding sets precise bids for each and every auction to help drive higher conversion volume or conversion value at a cost efficiency that is comparable to or better than existing performance goals.”<sup>26</sup> Advertisers can also set bid price manually.<sup>27</sup> However, [REDACTED]” (GOOG-RDGZ-00195309 at -516).

21. Appify, for example, leverages Smart Bidding for significant revenue gains for advertisers and Google. As Google explained, [REDACTED]

[REDACTED]

[REDACTED] Today, Smart Bidding for Appify (also known as conversion optimizer) is available on Search. This means that: when we detect that the app is installed on the user’s device, we will bid higher on that Search ad for a higher chance of mCVR [Mobile

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<sup>24</sup> An internal Google document states [REDACTED]

(GOOG-RDGZ-00207461 at -465). A May 2019 Google blog article stated “tROAS will be available next month for Google App campaigns on iOS and Android globally.” Sissie Hsiao, *Smart Strategies For Growing Your App Business with Ads*, Google Ads & Commerce Blog, <https://blog.google/products/ads/google-io-ads-announcements/> (Last accessed March 15, 2023).

<sup>25</sup> *About Smart Bidding and Smart Creative Solutions with Google Ads*, Google Ads Help, <https://support.google.com/google-ads/answer/9297584?hl=en> (Last accessed March 15, 2023).

<sup>26</sup> *Your Guide to Smart Bidding*, Google Ads Help, <https://support.google.com/google-ads/answer/11095984> (Last accessed March 15, 2023).

<sup>27</sup> *About Bidding in App Campaigns*, Google Ads Help, <https://support.google.com/google-ads/answer/7100895> (Last accessed March 15, 2023).

Conversion Rate]. This is going to launch on PLA [Product Listing Ads] in Q3'20 . . .” (GOOG-RDGZ-00202401 at -448).

22. Conversion tracking and attribution are key to bid optimization in order to maximize the likelihood of an ad leading to conversion. As Google explains, “Advertisers utilize app tracking SDKs to track app conversion events, and use these for bidding” (GOOG-RDGZ-00198985 at -985). “Accurate conversion data is critical for bidding performance — both for customers using Google auto-bidding, and those bidding manually. If conversion data becomes less granular and accurate, reduced bidding performance may lead to decreased advertiser investment in Google” (GOOG-RDDGZ-00148902 at -922).

23. Conversion tracking can be set up in Google Ads with conversion data imported from measurement [REDACTED] such as GA4F or AAPs. Once the advertiser organizes conversion events by measurement [REDACTED] such as GA4F into goals (e.g., Purchase), performance of future ad bids will be measured against conversion events tracked by GA4F. As Google explains, “[b]id on Firebase conversions ... including GA4F app events in ‘account-level goals’, previously known as ‘include in Conversions’. This allows to boost performance of deep linked campaigns: more than 2X conversions” (GOOG-RDGZ-00202401 at -455).

24. When GA4F was released, relatively few developers bid against conversions tracked by GA4F. In response to the relatively small percentage of advertisers bidding on GA4F conversions, Google implemented a project internally called Project Uno to “Drive adoption of Google Analytics for Firebase (GA4F [REDACTED])” (GOOG-RDGZ-00200228 at -242; *see also* GOOG-RDGZ-00177709 at -710). As stated in an internal Google document, the goal of [REDACTED] was to grow “mobile revenue with 100% of biddable<sup>28</sup> in-app and install conversions on Firebase only (GOOG-

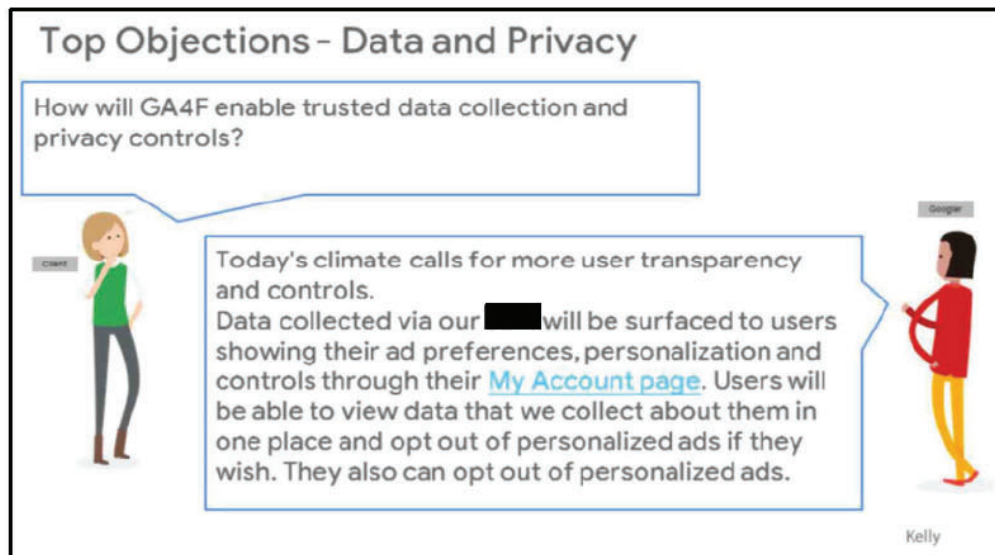
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<sup>28</sup> Google explains that “biddable = included in the ‘conversions’ column” for Google Ads reporting (GOOG-RDGZ-00202401 at -448).

RDGZ-00111850 at -851) and “[REDACTED] drives migration from AAP to 1P ([REDACTED]) This allows bidding optimization to rely on 1p path” GOOG-RDGZ-00196620 at -672). Google explained that “[e]specially because of the 1P [REDACTED] Strategy ([REDACTED]), Google Analytics plays a more strategic and impactful role in our growing Apps business (~\$10B ARR) than ever before. Unlike on web, our SDK and product are on the critical path to our App advertiser products, including Appify, and we have a big opportunity to drive incremental value because of our advertiser footprint” (GOOG-RDGZ-00059723 at -728). Rahul Oak, the former App Ads “lead” on Project Uno, described Project Uno as an effort “to build features to make [Google’s] advertising products more efficient and more useful for advertisers,” including through building “machine-learning models” (Oak Tr. 109:23-110:1, 110:6-10).

25. Google enticed advertisers to adopt GA4F in their apps by advertising that GA4F adoption would (1) create a 10-20% estimated performance gain for advertisers and (2) enable new features available only with GA4F, such as optimizing [REDACTED] in advertising (GOOG-RDGZ-00202698 at -700). Ironically, one of the benefits Google pitched to advertisers to switch from AAPs to GA4F was user transparency and control, shown in the figure below (GOOG-RDGZ-00197718 at -739). Google claimed that users can view their data in their My Account page, but as I discuss in my report, this only applies when users are signed-in and have turned WAA-on and sWAA-on. Contrary to what Google told developers, Google does not “surface[] to users” the data that Google “collect[s] via [its] [REDACTED]” if the user has turned off WAA or sWAA; users have no “transparency and control[]” over Google’s collection of this data.





26. Google's [redacted] has been quite successful since its launch in early 2019. Google's Supplemental Response to Interrogatory No. 17 states: "Google tracks app campaign ad spend that is bid against different types of conversions. As of last month [October 2022], approximately 55% of app campaign ad revenue was attributable to conversion types bid against GA4F (as opposed to other sources of conversions). Before [redacted] which launched in approximately 1H 2019, this percentage was significantly lower—approximately 6% or less. By October 31, 2019, this percentage was 10.6%. By October 21, 2020, it was 29.4%. By October 1, 2021, it was 49.4%. By October 1, 2022, it was 54.9%."

### 2.3 Conversion Modeling

27. When precise conversion tracking or attribution is not possible, Google uses machine learning algorithms to perform conversion modeling. As Google explains, "Google has used conversion modeling in conversion reporting for years ... modeling has always been necessary in environments where we cannot fully link ad interactions to conversions. More recently, we have modeled conversions for apps, when the ad originates on iOS ... When Google surfaces modeled conversions in Google Ads, we are predicting attributed conversions. In most cases, Google will

receive ad interactions and conversions but is missing the linkage between the two. The modeling we perform is modeling whether a Google ad interaction led to the conversion, we are not modeling whether a conversion happened or not” (GOOG-RDGZ-00142709 at -709). Google further explains that “[i]n order to model for the non observed slice, we try our best to use data from high fidelity observable slices where we know behaviour is the same or very similar to the unobserved slice ... We leverage ground-truth from historical conversion rates, device type, time of day, geo, operating system, and more, to predict the likelihood of a conversion event across the set of users who viewed or clicked on an ad” (GOOG-RDGZ-00142709 at -711).

28. For app ads, Google explains that “[t]oday, the Google Ads Front End (GAFE) does not distinguish between modeled conversions and non-modeled (i.e. deterministically measured) conversions. On App Ads, we create modeled conversions for [REDACTED] (modeling x-device conversions) and [REDACTED] (modeling mobile web search conversions...)” (GOOG-RDGZ-00208133 at -133). In another document, Google explains that [REDACTED] performs “iOS conversion modeling based on ML [machine learning]. Beta launched in early July 2018” (GOOG-RDGZ-00193001 at -005) and [REDACTED] is a “Project name for iOS conversion tracking tying Zweiback Cookies from web to IDFA. Launched in Q1 2018 with 25% coverage” (GOOG-RDGZ-00193001 at -006).

# Appendix A-13

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**UNITED STATES DISTRICT COURT**  
**NORTHERN DISTRICT OF CALIFORNIA**  
**SAN FRANCISCO**

ANIBAL RODRIGUEZ AND JULIE ANNA  
MUNIZ, individually and on behalf of all other  
similarly situated,

Plaintiff,

vs.

GOOGLE LLC, *et al.*,

Defendant.

Case No. 3:20-CV-04688 RS

**DEFENDANT GOOGLE LLC’S  
FOURTH SUPPLEMENTAL  
RESPONSES AND OBJECTIONS TO  
PLAINTIFFS’ INTERROGATORIES,  
SET ONE**

Judge: Hon. Richard Seeborg  
Courtroom: 3, 17th Floor  
Action Filed: July 14, 2020

PROPOUNDING PARTY: PLAINTIFFS ANIBAL RODRIGUEZ AND JULIEANNA MUNIZ

RESPONDING PARTY: DEFENDANT GOOGLE LLC

SET NO.: ONE

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on that Google data collection, (c) what impact if any an app’s disabling of analytics data collection has on that Google data collection, and (d) what impact if any an app’s decision to use or not use any Google services apart from Firebase SDK has on that Google data collection.

**RESPONSE TO INTERROGATORY NO. 1:**

Google objects to Interrogatory No. 1 as vague and ambiguous as to the undefined term “Web & App Activity.” For purposes of this response, Google construes Web & App Activity to mean the account-level setting called Web & App Activity. Google further objects to this Interrogatory as vague and ambiguous with respect to the phrases “Google’s data collection,” “impact” and “Firebase SDK.” Google further objects that the definition of “Class Period” is vague and ambiguous, as the Interrogatory defines the term to mean “the class period in this case, as defined in the operative complaint,” when the “operative complaint” has changed between when the Interrogatories were served and when these responses were provided, and the definition of “Class Period” differs between the original and amended complaints. Google further objects that the term “Class Period” is vague and ambiguous because it fails to provide a concrete range of time. Google further objects to this Interrogatory to the extent that it seeks information protected by the attorney-client privilege and/or the attorney work product doctrine. Google further objects to this Interrogatory as unduly burdensome, overbroad, and disproportionate to the needs of the Action because this Interrogatory seeks information outside of the Class Period, which has little to no bearing on Plaintiffs’ claims.

Subject to and without waiving the foregoing objections, Google responds as follows: The type of information that can be collected through the Google Analytics for Firebase default implementation, if authorized by an entity that uses Google Analytics for Firebase, includes: (1) number of users and sessions, (2) first launches, (3) in-app purchases, (4) session duration, (5) screen views, (6) app updates, (7) operating system updates and (8) uninstalls. If an entity chooses to use Google Analytics for Firebase, it authorizes that the following parameters are collected by default with every event that is collected either by default or manually, as instructed by the app developer: (1) screen information, and (2) session information. Further, if an entity chooses to use Google Analytics for Firebase, it authorizes the following automatically-collected

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1 device-related dimensions: (1) operating system, (2) device model, (3) language, (4) app store,  
2 (5) app version, and (6) first launch time. Web & App activity is an account-level setting that  
3 functions independently from Google Analytics for Firebase. Accordingly, a user turning off Web  
4 & App Activity does not prevent apps from collecting data via Google Analytics for Firebase,  
5 which is a separate product that apps may choose to utilize to collect and analyze their own users’  
6 data.

**SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 1:**

8 Subject to and without waiving the foregoing objections, Google responds further as  
9 follows: Since its launch, Google Analytics for Firebase has collected the following types of  
10 information by default, if Google Analytics for Firebase was enabled by an app developer using  
11 the Firebase SDK: (1) number of users and sessions, (2) first launches, (3) in-app purchases,  
12 (4) session duration, (5) app updates, (6) operating system updates and (7) uninstalls. As of  
13 October 24, 2016, Google Analytics for Firebase has also collected screen views. If an entity  
14 chooses to use Google Analytics for Firebase, it authorizes that the following parameters are  
15 collected by default with every event that is collected either by default or manually, as instructed  
16 by the app developer: (1) screen information, and (2) session information. Google Analytics for  
17 Firebase has collected these parameters by default since its launch. Further, if an entity chooses to  
18 use Google Analytics for Firebase, it authorizes the following automatically-collected device-  
19 related dimensions: (1) operating system, (2) device model, (3) language, (4) app store, (5) app  
20 version, and (6) first launch time. Google Analytics for Firebase has automatically collected these  
21 device-related dimensions since its launch.

22 Web & App activity is an account-level setting that functions independently from Google  
23 Analytics for Firebase. Accordingly, a user turning off Web & App Activity does not prevent  
24 apps from collecting data via Google Analytics for Firebase, which is a separate product that apps  
25 may choose to utilize to collect and analyze their own users’ data. The data logged by Google  
26 Analytics for Firebase in its default implementation are not collected if a developer has not  
27 enabled Google Analytics for Firebase. There are other products and features that are part of  
28 Firebase SDK that may collect overlapping pieces of data, such as device model, app updates, and

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1 other types of data, but all such functionality is publicly documented and intentionally  
2 implemented by app developers. Each such product and feature, none of which are implicated by  
3 the First Amended Complaint, separately obtain consent and publicly disclose their functionality.

4 Finally, footnote 13 of the First Amended Complaint cites  
5 <https://firebase.google.com/docs/app-indexing/android/log-actions>, which is a webpage dealing  
6 with a separate Firebase SDK product called “App Indexing.” As the cited webpage notes, App  
7 Indexing cannot collect event data unless certain conditions are met, including that a user has  
8 turned their Web & App Activity Control to “on.”

9 **SECOND SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 1:**

10 Subject to and without waiving the foregoing objections, Google responds further as  
11 follows:

12 Google carefully processes information it receives from app developers via Google  
13 Analytics for Firebase (“GA for Firebase”). As explained herein, entities that choose to use GA  
14 for Firebase must incorporate it into their apps, enable its function, and thereby cause it to begin  
15 logging event data that is subsequently uploaded to Google servers for analysis and reporting.  
16 Google takes measures to process event data sent to Google via GA for Firebase according to the  
17 type of consent each user gives. For example, Google runs consent checks on the data during  
18 several processing steps, and it only associates event data with a specific user when the user has  
19 consented to that, including by having the WAA control turned to “on.” When consent is lacking,  
20 Google takes several sophisticated technological steps to ensure that event data cannot be  
21 associated with a specific user, including by imposing several technological barriers to what is  
22 known as unauthorized “joining” of logs together to de-anonymize users. Unauthorized joining is  
23 forbidden, and Google also takes several steps to ensure access to the logs in question is restricted.  
24 Google does not join user event data collected via GA for Firebase to re-identify anonymized data.  
25 Google’s customers are likewise never given access to data that could be used to de-anonymize  
26 users.

27 Plaintiffs’ First Amended Complaint cites and quotes public documentation about GA for  
28 Firebase to demonstrate the types of user app interaction data, or “event data” that Plaintiffs allege



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1 Google is improperly collecting. In order for the data collection described in each of those pieces  
2 of documentation to occur, an app developer must enable GA for Firebase. If app developers don’t  
3 enable GA for Firebase, the data that would otherwise be sent to Google servers by GA for  
4 Firebase isn’t sent to Google servers. Google doesn’t implement in Firebase SDK any “shadow”  
5 copy of GA for Firebase that operates regardless of whether a developer has enabled GA for  
6 Firebase, nor does Google has any “secret scripts” that ignore the consent settings of users in order  
7 to connect event data to specific users’ profiles. GA for Firebase will not store event data  
8 connected to a specific user’s profile unless the app has permitted it and a user has opted into  
9 certain features, namely: the supplemental checkbox under the WAA control (sWAA), which can  
10 only be turned on if WAA is also turned on; Google Ads Personalization (GAP); and the  
11 supplemental checkbox under the GAP control (NAC). Finally, based on a reasonable  
12 investigation, Google has been unable to identify any impact an app's decision to use or not use a  
13 Google product or service other than Firebase SDK would have on the functioning of GA for  
14 Firebase as described below.

15 With regard to the other products and features that are part of Firebase SDK that may  
16 collect overlapping pieces of data, such as device model, app updates, and other types of data,  
17 such functionality is publicly documented including on Google’s public help center pages at  
18 GOOG-RDGZ-00013288 - GOOG-RDGZ-00013449, which can also be viewed at  
19 firebase.google.com and support.google.com.

**THIRD SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 1:**

21 Subject to and without waiving the foregoing objections, Google responds further as  
22 follows:

23 Google carefully processes information it receives from app developers via Google  
24 Analytics for Firebase (“GA for Firebase”). As explained herein, entities that choose to use GA  
25 for Firebase must incorporate it into their apps, enable its function, and thereby cause it to begin  
26 logging event data that is subsequently uploaded to Google servers for analysis and reporting.  
27 Google takes measures to process event data sent to Google via GA for Firebase according to the  
28 type of consent each user gives. For example, Google runs consent checks on the data during



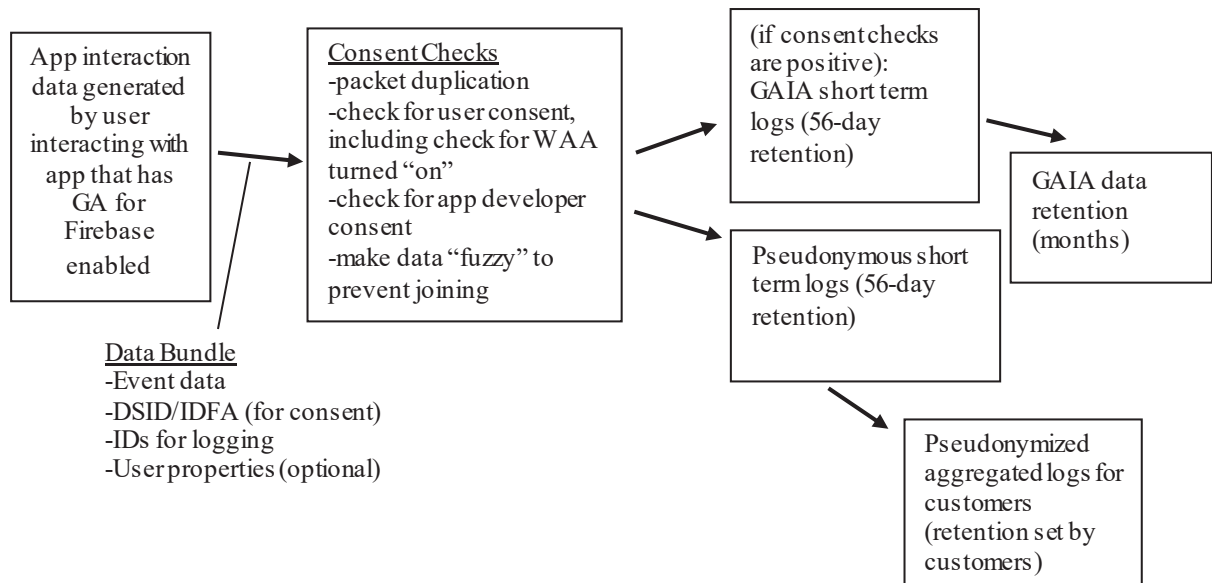
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1 several processing steps, and it only associates event data with a specific user when the user has  
2 consented to that, including by having the WAA control turned to “on.” When consent is lacking,  
3 Google takes several sophisticated technological steps to ensure that event data cannot be  
4 associated with a specific user, including by imposing several technological barriers to what is  
5 known as unauthorized “joining” of logs together to de-anonymize users. Unauthorized joining is  
6 forbidden, and Google also takes several steps to ensure access to the logs in question is restricted.  
7 Google does not join user event data collected via GA for Firebase to re-identify anonymized data.  
8 Google’s customers are likewise never given access to data that could be used to de-anonymize  
9 users.

10 Plaintiffs’ First Amended Complaint cites and quotes public documentation about GA for  
11 Firebase to demonstrate the types of user app interaction data, or “event data” that Plaintiffs allege  
12 Google is improperly collecting. In order for the data collection described in each of those pieces  
13 of documentation to occur, an app developer must enable GA for Firebase. If app developers don’t  
14 enable GA for Firebase, the data that would otherwise be sent to Google servers by GA for  
15 Firebase isn’t sent to Google servers. Google doesn’t implement in Firebase SDK any “shadow”  
16 copy of GA for Firebase that operates regardless of whether a developer has enabled GA for  
17 Firebase, nor does Google has any “secret scripts” that ignore the consent settings of users in order  
18 to connect event data to specific users’ profiles. GA for Firebase will not store event data  
19 connected to a specific user’s profile unless the app has permitted it and a user has opted into  
20 certain features, namely: the supplemental checkbox under the WAA control (sWAA), which can  
21 only be turned on if WAA is also turned on; Google Ads Personalization (GAP); and the  
22 supplemental checkbox under the GAP control (NAC). Finally, based on a reasonable  
23 investigation, Google has been unable to identify any impact an app’s decision to use or not use a  
24 Google product or service other than Firebase SDK would have on the functioning of GA for  
25 Firebase as described below.  
26  
27  
28

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At a high level, the data flow of event data associated with GA for Firebase can be thought of conceptually as follows:



Each of these steps is discussed in further detail below.

### 1. Data Logging

When app developers enable GA for Firebase, code authored by Google and activated by developers logs certain user interaction events automatically, such as the first opening of an app or when a user clicks on a certain part of the app. *See generally*

<https://support.google.com/firebase/answer/9234069?hl=en>.

GA for Firebase on Android also logs: **DSID** (if the developer permits it, *e.g.*, if Google Signals is enabled for the Google Analytics property), which makes it possible to check against a specific user’s privacy settings to ensure consent is provided; and **adid**, or “Ad ID,” which is used for advertising purposes under certain circumstances as described more fully below.<sup>1</sup> On iOS, GA for Firebase logs **IDFA**, or “Identifier for Advertiser,” which is the rough equivalent of the Ad ID on Android.

<sup>1</sup> See <https://www.google.com/url?q=https://firebase.google.com/docs/analytics/configure-data-collection?platform%3Dandroid&sa=D&source=editors&ust=1623176595924000&usg=AOvVaw2T8YBUbEk1Od-0SpMEX0d>.

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GA for Firebase also logs the device’s ads personalization opt-out setting: “opt-out of ads personalization, or OOOAP for Android and “limit ad tracking,” or LAT for iOS.

GA for Firebase also logs a unique **app\_instance\_id**, which identifies the app session of the particular app running on a particular device. **app\_instance\_id** is not persistent; it can be refreshed when users take certain actions such as re-installing apps, certain updates to apps, and other similar actions.

Finally, for ads interactions, GA for Firebase also logs **aeid**, or “Ad Event ID,” which is a unique identifier for the specific ad interaction logged in order to enable integration between GA for Firebase and AdMob if the customer has linked their AdMob app to Google Analytics.

This logging occurs at the same time as the interactions that trigger the event. For example, when a user clicks a specific button that the app developer has chosen to track using GA for Firebase, that button click is logged as it occurs. It is typically not uploaded to Google servers until later.

## **2. Data Upload**

Apps with GA for Firebase enabled log and send information to Google via GA for Firebase code in a packet sometimes referred to as a “HitBundle.” These packets contain (1) event information including **app\_instance\_id**, (2) DSID/IDFA for consent checks, and (3) non-personally identifiable information (PII) for user properties (if the app developer chooses to include such data). A HitBundle can contain multiple events grouped together. Event information includes different types of user-interaction data, as discussed above. The predefined and recommended events and user properties are publicly defined by Google. User properties are slowly changing data that describe the device or user of the device that an app developer may send, but it cannot send PII.

All of the HitBundle data is sent to Google in a single transmission. In other words, the app-interaction event data and user properties are sent to Google in the same packet as the DSID/IDFA, which is the information that allows Google to run consent checks.

For Android apps with Google Play Services enabled, GA for Firebase data is collected from all apps into a central file called **app\_measurement.db**, which is periodically uploaded to

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1 Google’s servers. Google does this because it saves battery for users, whose devices would  
2 otherwise be initiating more uploads every day. On iOS devices, this is not possible, so each GA-  
3 for-Firebase-enabled app periodically transmits the data to Google’s servers individually.

4 In all cases, data is first logged by GA for Firebase, recorded on the user’s device in the  
5 appropriate file, and then subsequently uploaded to Google servers.

### 6 **3. Consent Checks and Technical Barriers to Joining**

7 HitBundles are received by Google at a “collection endpoint,” where the data is stored in  
8 short-term memory. Before any data is ever written to disk, the server completes several important  
9 steps designed to protect user privacy. The first step is to check if the customer has enabled  
10 Google Signals. Everything described below regarding data duplication and consent checks is  
11 gated on whether the customer has enabled Google Signals. If the customer hasn’t enabled Google  
12 Signals, the HitBundle is treated purely pseudonymously.

13 A preliminary step before the consent check occurs is data duplication. A single copy of  
14 the data packet received from a user’s mobile device is made. This is done to facilitate the  
15 eventual data logging that respects user consent choices. One copy could become tied to a user’s  
16 account if consent checks permit it; the other will become a pseudonymous log. During this time  
17 period, the copies are stored in short-term memory. The time between receipt and logging is  
18 typically less than five minutes.

19 Then, Google checks to see if a user is signed into their Google Account and whether they  
20 have opted into certain privacy controls, namely: the supplemental checkbox under the WAA  
21 control (sWAA), which can only be turned on if WAA is also turned on; Google Ads  
22 Personalization (GAP); and the supplemental checkbox under the GAP control (NAC). Each of  
23 WAA, sWAA, GAP, and NAC are account-level Web & App Activity and Ads Personalization  
24 controls. If sWAA, GAP, and NAC are all turned on, the result of the consent check is that the  
25 data can be tied to a user’s Google account in what is known as “GAIA space.” If any of these  
26 controls are off, then the data isn’t joined to a user’s Google account, and therefore not logged in  
27 “GAIA space.”

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1 The consent check actually happens in several steps, all in short-term memory, before any  
2 data is written to disk, *i.e.*, stored: (a) data is received at Google’s servers and, if Google Signals is  
3 enabled, it is duplicated to facilitate logging; (b) Google uses a server to check whether a user is  
4 logged into a Google Account and whether consent has been given to join data to the account (the  
5 sWAA, GAP, and NAC settings discussed above); and (c) the data sets are cleaned and some data  
6 is regenerated to add additional obstacles to joining data.

7 To do this check, Google uses a DSID (IDFA on iOS). It tells Google who the user is by  
8 checking the DSID, which is an encrypted GAIA identifier. There will be no DSID in the  
9 HitBundle if the user is not signed into a Google Account. On iOS devices, the IDFA is associated  
10 with GAIA when users have logged into their Google Account and have not limited ad tracking.  
11 Google also checks to make sure the app developer consents to the tying of GA for Firebase data  
12 to users’ accounts.<sup>2</sup>

13 Importantly, the Google server that receives the HitBundle, called [REDACTED], cannot decrypt  
14 the DSID. This is by design. Instead, [REDACTED] must send the encrypted DSID to a different Google  
15 server that performs the consent check and then returns to [REDACTED] either a “no consent” signal, or an  
16 encrypted GAIA ID. As a result, the hit bundles in short term memory on the [REDACTED] server cannot  
17 reflect a user’s identity until a “yes consent” signal is received from a different server, which itself  
18 never receives the measurement data logged by GA for Firebase. All of this occurs in short term  
19 memory. The upshot of this is that the physical machine that receives the encrypted DSID from  
20 user devices isn’t able to decrypt it, and the physical machine that decrypts the DSID doesn’t  
21 receive the measurement data, it only gets the fields that can be used to check identity. This is all  
22 done to make it even less possible that a bad actor could infiltrate Google’s system and perform an  
23 unauthorized “join.”

24  
25  
26 <sup>2</sup> See

27 [https://www.google.com/url?q=https://support.google.com/analytics/answer/7532985?hl%3Den%23zippy%3D%252Cin-this-article&sa=D&source=editors&ust=1623176595926000&usg=AOvVaw1v59Uqg6gqH\\_XGgl4Z76xO](https://www.google.com/url?q=https://support.google.com/analytics/answer/7532985?hl%3Den%23zippy%3D%252Cin-this-article&sa=D&source=editors&ust=1623176595926000&usg=AOvVaw1v59Uqg6gqH_XGgl4Z76xO).  
28

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1 If any aspect of the consent check fails, the user data is not stored in GAIA space, and the  
2 DSIS/IDFA is deleted.

3 After the consent check is completed and data is duplicated into two logs, Google removes  
4 data from each log to prevent “joining,” which is a technical term that refers to re-identifying  
5 pseudonymized users by joining data from disparate parts of data held by Google together.  
6 Google takes a number of steps throughout its organization to prevent unauthorized joining of user  
7 data, and employees are, generally speaking, barred from doing it. Encryption is used to prevent  
8 Google personnel from identifying the data without authorization. Decryption keys are tightly  
9 controlled, and destroyed after a set period of time, making it impossible to re-join the data.

10 From the signed-in GAIA copy of data, Google removes all pseudonymous identifiers.  
11 From the signed-out pseudonymous log, Google removes all signed-in identifiers. The result is  
12 that the two logs don’t overlap identifiers that could be used to join the logs together.

13 Google additionally regenerates data to prevent deterministic joining. A “deterministic”  
14 or “probabilistic” join would allow a complicated algorithm to use brute force and probability to  
15 guess which data belongs to which person. While the data is still in short term memory, Google  
16 creates “fuzziness,” or slight errors, in data to prevent this. For example, Google adds random  
17 error into timestamps so they can’t be matched together with timestamps elsewhere.

**4. Differentiated Logging**

18 Pseudonymous short-term logs have a 56-day retention period. They store the  
19 pseudonymized copy of the user interaction data—that is, they don’t contain any identifying  
20 information, so it’s not possible to tell to which user the event data belongs. They are used to  
21 create aggregated event data logs for customer use. GAIA short-term logs contain the same event  
22 data but keyed to a specific user.

23 To ensure that joining is practically impossible, Google takes several steps to scrub these  
24 logs of data that overlaps with data in other logs. Pseudonymous logs don’t contain GAIA IDs.  
25 GAIA logs don’t contain Device ID or app\_instance\_id. Both logs do contain aeid, or Ad Event  
26 ID, but in the pseudonymous log, aeid is encrypted with a 6-day retention key that is different  
27 from the encryption key used to encrypt Ad Event ID in GAIA logs. Further, in GAIA logs, aeid is  
28

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1 “salted” as well, meaning random data is added to it to make it even harder to match it to the acid  
2 stored in pseudonymous logs. As a practical matter, connecting these to each other is impossible.

3 **5. Google’s Encryption Technology**

4 As further background, Google’s encryption technology creates new encrypted keys every  
5 day. This enables the encryption keys to be retained for a fixed period (for example 60 days) of  
6 time for decryption purposes. Once the period of time passes, the keys are deleted, making  
7 decryption impossible. GA for Firebase also uses a different encryption key for the same user ID  
8 in GAIA space as compared to pseudonymous space (and in the case of acid, in AdMob  
9 space). For that reason, it is prohibitively expensive to decrypt data from one log (e.g.,  
10 pseudonymous) and join the data with another log.

11 For a set period of time, some IDs (device ID, app instance ID, and ad event ID) are stored  
12 and encrypted to allow Google to account for possible delays in data transmission and to fix any  
13 errors in data processing, including at customers’ (i.e., app developers’) request.

14 *Device ID and app-instance ID* are stored in encrypted form for 60 days. The reason the  
15 keys are stored for 60 days is because there are sometimes errors in the logs that require  
16 reprocessing of data. The 60-day window allows for customers to request reprocessing. It also  
17 allows Google to scan the logs to determine the amount of data affected by errors, which informs  
18 solutions to code issues. Google personnel are barred from using these keys without authorization,  
19 Google has monitors in place to ensure such unauthorized use doesn’t happen, and access to the  
20 keys is tightly controlled. As a general matter, humans who work for Google would have no  
21 reason to gain access to these keys, and they don’t. Computers do use them to reprocess data, as  
22 described here, but this happens without humans learning the keys, not unlike swiping a credit  
23 card at a grocery store.

24 *Ad event IDs* are stored in encrypted form for 6 days. These IDs are specific to a user’s  
25 particular interaction with an ad. Ad event IDs allow Google to expand the Google Analytics  
26 pseudonymous data set with data from ADMob logs *if* the user has provided the proper  
27 permissions. Where a user interacts with a product that uses AdMob, that interaction is stored in  
28 AdMob logs and that data is joined to the Analytics data set using the ad-event ID.



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1 The encryption keys are retained for 6 days to allow for processing time and errors. The  
2 processing happens daily and in some cases takes a few hours. If reprocessing of the data is  
3 necessary due to some error, the 6-day window allows Google time to do the reprocessing.

4 As discussed above, the ad event ID is the only unique ID common to both GAIA space  
5 and signed-out space that would allow for joining of data to a specific user. This means that for  
6 the 6-day window in which the ad event ID is stored with encryption, it is theoretically possible  
7 for someone with access to both ad event ID encryption keys to join data.

8 Google takes several steps to ensure this does not happen. As described above, Google  
9 generates new encryption keys each day and it uses a different key for the same user ad event ID  
10 in GAIA space as compared to pseudonymous space. Access to the encryption keys is tightly  
11 controlled and even the teams of engineers that create the code for GA for Firebase and related  
12 products/services do not have access to the keys. Google also protects the code that requires use  
13 of encryption keys. Once the 6-day period has elapsed, it is not possible for Google (or any other  
14 bad actor) to rejoin data stored in the pseudonymous logs with a user profile using the ad event ID.

15 Further, Google uses a restricted need-based access process and audit procedure. To begin,  
16 Google supports tiered access to the logs stored by GA for Firebase. None of the tiers includes  
17 personally identifiable information, but the default access level, for example, includes only event  
18 data, so Google employees cannot see any identifiers at all. Querying a log past the default state  
19 (i.e., geolocation logs or raw logs) requires a request ticket that allows Google to audit and track  
20 the request. Through that system, teams have to explain why they need a specific level of beyond-  
21 default access. Even if such access is granted, Google does not allow access forever. There are  
22 temporal restrictions: access is granted for a certain time frame after which teams will need to re-  
23 request access.

**24 6. Use of User Data by Customers**

25 User data is made available to external customers from whom the data originally was  
26 transmitted so they can conduct analytics and other marketing campaigns.

27 When data is reported to app developers, it is done so on an aggregated level. After  
28 pseudonymous logs are created, a subset of the data in them is then used to create the database for



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the back-end of GA for Firebase that feeds customers with aggregated reports. None of the ID data in that database overlaps with data in GAIA space, so no joining between them is possible. Both datasets do include event data, however, though timestamps are made “fuzzy” to prevent joining, as discussed above.

**7. Use of Pseudonymous User Data by Google**

Google uses user data collected via GA for Firebase across teams for product development, improvement, and diagnostics. As discussed above, if a user has provided consent, and if the AdMob and GA for Firebase Administrators at the customer have linked their AdMob account to their GA for Firebase app, Google can also join event data from GA for Firebase logs with AdMob log data in order to target advertising to users, all without personally identifying the user.

With regard to the other products and features that are part of Firebase SDK that may collect overlapping pieces of data, such as device model, app updates, and other types of data, such functionality is publicly documented including on Google’s public help center pages at GOOG-RDGZ-00013288 - GOOG-RDGZ-00013449, which can also be viewed at firebase.google.com and support.google.com.

**FOURTH SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 1:**

Subject to and without waiving the foregoing, and without waiving any claim of privilege or protection of the work product doctrine, Google further responds as follows:

Google carefully processes information it receives from app developers via Google Analytics for Firebase (“GA for Firebase”). As explained herein, entities that choose to use GA for Firebase must incorporate it into their apps, enable its function, and thereby cause it to begin logging event data that is subsequently uploaded to Google servers for analysis and reporting. Google takes measures to process event data sent to Google via GA for Firebase according to the type of consent each user gives. For example, Google runs consent checks on the data during several processing steps, and it only associates event data with a specific user when the user has consented to that, including by having the WAA control turned to “on.” When consent is lacking, Google takes several sophisticated technological steps to ensure that event data cannot be associated with a specific user, including by imposing several technological barriers to what is

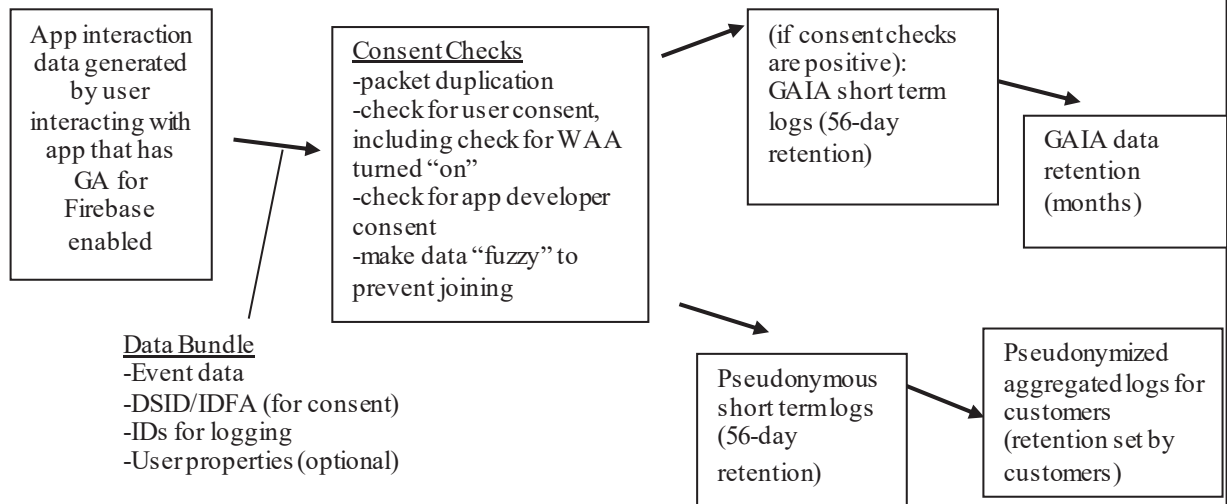
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1 known as unauthorized “joining” of logs together to de-anonymize users. Unauthorized joining is  
2 forbidden, and Google also takes several steps to ensure access to the logs in question is restricted.  
3 Google does not join user event data collected via GA for Firebase to re-identify anonymized data.  
4 Google’s customers are likewise never given access to data that could be used to de-anonymize  
5 users.

6 Plaintiffs’ First Amended Complaint cites and quotes public documentation about GA for  
7 Firebase to demonstrate the types of user app interaction data, or “event data” that Plaintiffs allege  
8 Google is improperly collecting. In order for the data collection described in each of those pieces  
9 of documentation to occur, an app developer must enable GA for Firebase. If app developers don’t  
10 enable GA for Firebase, the data that would otherwise be sent to Google servers by GA for  
11 Firebase isn’t sent to Google servers. Google doesn’t implement in Firebase SDK any “shadow”  
12 copy of GA for Firebase that operates regardless of whether a developer has enabled GA for  
13 Firebase, nor does Google has any “secret scripts” that ignore the consent settings of users in order  
14 to connect event data to specific users’ profiles. GA for Firebase will not store event data  
15 connected to a specific user’s profile unless the app has permitted it and a user has opted into  
16 certain features, namely: the supplemental checkbox under the WAA control (sWAA), which can  
17 only be turned on if WAA is also turned on; Google Ads Personalization (GAP); and the  
18 supplemental checkbox under the GAP control (NAC). Finally, based on a reasonable  
19 investigation, Google has been unable to identify any impact an app’s decision to use or not use a  
20 Google product or service other than Firebase SDK would have on the functioning of GA for  
21 Firebase as described below.  
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At a high level, the data flow of event data associated with GA for Firebase can be thought of conceptually as follows:



Each of these steps is discussed in further detail below.

### 1. Data Logging

When app developers enable GA for Firebase, code authored by Google and activated by developers logs certain user interaction events automatically, such as the first opening of an app or when a user clicks on a certain part of the app. *See generally*

<https://support.google.com/firebase/answer/9234069?hl=en>.

GA for Firebase on Android also logs: **DSID** (if the developer permits it, e.g., if Google Signals is enabled for the Google Analytics property), which makes it possible to check against a specific user’s privacy settings to ensure consent is provided; and **adid**, or “Ad ID,” which is used for advertising purposes under certain circumstances as described more fully below.<sup>3</sup> On iOS, GA for Firebase logs **IDFA**, or “Identifier for Advertiser,” which is the rough equivalent of the Ad ID on Android.

GA for Firebase also logs the device’s ads personalization opt-out setting: “opt-out of ads personalization, or OOOAP for Android and “limit ad tracking,” or LAT for iOS.

<sup>3</sup> See <https://www.google.com/url?q=https://firebase.google.com/docs/analytics/configure-data-collection?platform%3Dandroid&sa=D&source=editors&ust=1623176595924000&usg=AOvVaw2T8YBUbEk1Od-0SpMEX0d>.

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GA for Firebase customers can also choose to disable personalized advertising for the whole app, geographic regions, specific users, or specific events or user properties.<sup>4</sup>

GA for Firebase also logs a unique **app\_instance\_id**, which identifies the app session of the particular app running on a particular device. **app\_instance\_id** is not persistent; it can be refreshed when users take certain actions such as re-installing apps, certain updates to apps, and other similar actions. It is also refreshed automatically when customers reset their advertising identifier.

Finally, for ads interactions, GA for Firebase also logs **aeid**, or “Ad Event ID,” which is a unique identifier for the specific ad interaction logged in order to enable integration between GA for Firebase and AdMob if the customer has linked their AdMob app to Google Analytics.

Event-logging occurs at the same time as the interactions that trigger the event. For example, when a user clicks a specific button that the app developer has chosen to track using GA for Firebase, that button click is logged as it occurs. It is typically not uploaded to Google servers until later.

## 2. Data Logging Technical Details

A comprehensive list of measurement data collected by Google Analytics for Firebase is [here](#). Measurement data collected for Google Analytics for Firebase includes:

- IDFA/IDFV (on iOS); **adid** (on Android) as well as the LAT setting
- **app\_instance\_id**, which is a randomly generated identifier (UUID) on a device for a given app (plays a similar role to a first party cookie on the web)
- **app\_id**, aka **bundle\_id** (on iOS) and **package\_id** (on Android)
- hash of developer cert (if applicable for the mobile platform)
- IP address (for geo lookup)
- information about the OS, OS version and device information
- First launch events, including timestamp of the first launch

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<sup>4</sup> See <https://support.google.com/analytics/answer/9626162?hl=en>.

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- In App Purchase events, including timestamp of the event, transaction ID, product ID, product name, price, currency code and quantity. IAP data will be collected automatically on iOS. The Google Analytics customer is required to link their Analytics property to Google Play to collect IAP data automatically on Android.

- collect referrer param string associated with the last campaign click that is attributable to a conversion

Google Analytics for Firebase also facilitates the logging of events related to Firebase Cloud Messaging (FCM). The FCM SDK logs the following events through Google Analytics for Firebase, when present and enabled:

- notification\_receive : when the push notification was received by the app
- notification\_foreground : when the push notification was received by the app while the app was in the foreground
- notification\_open : when the user chose to open the notification
- notification\_dismiss : when the user chose to dismiss the notification

While the FCM SDK does log debug messages corresponding to each of these events, those logs are entirely private to the app itself and can only be accessed by the app or by the developer when they have connected their debug device to their development host via USB. FCM does not log corresponding events to their own server. FCM uses the Google Analytics for Firebase standard means of logging events which results in these notification-related events being bundled and uploaded along with all other app events. Google Analytics for Firebase is the single owner and authority on the events enumerated above.

Each of these FCM events also logs corresponding event parameters to contextualize the push notification. These event parameters are:

- gcm\_message\_name: the name of the message in the FCM “Message Composer” UX

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- `gcm_message_time`: the time at which the developer chose to broadcast push notifications. Alternatively, if the developer chose to use “device-local” time, `message_time` indicates a delivery time relative to each device’s time zone.
- `gcm_message_use_device_time` : a flag which determines the interpretation of `message_time`.
- `gcm_message_id`: a unique ID for the message campaign
- `gcm_sender_id`: the sender ID corresponds to the developer’s cloud project ID

These parameters correspond to fields in message campaigns launched by the GCM Product on the Web. None of these parameters are associated with users or devices.

These events are aggregated in tables in a manner consistent with all other events. Furthermore, app developers are able to send events and user properties to Google Analytics for Firebase. An event has a string name, and up to 25 event parameters (name / value pairs). It represents an event of interest happening inside the app on a particular device. Multiple events may be batched together into multiple HitBundle. In addition to events, a HitBundle may also carry user properties (name / value pairs), which are slowly changing data describing the device or the user of the device. App developers should not send PII in either event names, event parameters or user properties. Doing so is considered a violation of GMP TOS.

The app events data are joined with additional information on the server side, e.g., a device’s screen resolution is derived based on a device model name. GA for Firebase collects app events data for mobile apps that are built with the Google Mobile Platform. The Firebase Analytics SDK also facilitates the logging of events related to Firebase Crashlytics.

The Firebase Crashlytics SDK will log the following events through Google Analytics, if present and enabled:

*app\_exception*

In addition to logging this new event, Firebase Crashlytics captures the last N events that are logged on the device and -- upon an exception/crash -- reports these to their own BE.

The Google Analytics for Firebase SDK facilitates the setting of User Properties related to Firebase Cloud Messaging and Firebase Remote Config (aka Config).

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1 The Firebase Cloud Messaging SDK will set the following User Property using the Google  
2 Analytics API, when present and enabled:

3 firebase\_last\_notification (working name)

4 The Firebase Remote Config SDK will set the following User Properties using the Google  
5 Analytics API:

6 firebase\_experiment1\_group (working\_name)

7 firebase\_experiment2\_group (working\_name)

8 The Google Analytics for Firebase SDK will collect the [Instance ID](#) (IID) for the purposes  
9 of Audience List exporting to Firebase. The SDK collects this ID from the user’s device and  
10 includes it in the HitBundle.

11 On Android, the Google Analytics for Firebase SDK will collect the Android ID on  
12 devices that do not have Google Play Services installed. Devices without Google Play Services do  
13 not provide resettable\_device\_id (AdID).

14 The Google Analytics backend also aggregates per user cumulative metrics for Firebase  
15 A/B Testing (ABT). These metrics are used by ABT backends to determine the winning variation  
16 of multiple candidates. The access requirements of this data is same as all other aggregated  
17 Google Analytics data.

18 Google also supports view based campaign attribution (a.k.a. VTC) in addition to click  
19 from both adwords and 3rd party. If a user has not clicked on an ad previously, but has an ad view  
20 then Google will attribute the conversion to the ad viewed.

### 21 3. Data Upload

22 Apps with GA for Firebase enabled log and send information to Google via GA for  
23 Firebase code in a packet sometimes referred to as a “HitBundle.” These packets contain (1)  
24 event information including app\_instance\_id, (2) DSID/IDFA for consent checks, and (3) non-  
25 personally identifiable information (PII) for user properties (if the app developer chooses to  
26 include such data). A HitBundle can contain multiple events grouped together. Event information  
27 includes different types of user-interaction data, as discussed above. The predefined and  
28 recommended events and user properties are publicly defined by Google. User properties are



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1 slowly changing data that describe the device or user of the device that an app developer may  
2 send, but it cannot send PII.

3 All of the HitBundle data is sent to Google in a single transmission. In other words, the  
4 app-interaction event data and user properties are sent to Google in the same packet as the  
5 DSID/IDFA, which is the information that allows Google to run consent checks.

6 For Android apps with Google Play Services enabled, GA for Firebase data is collected  
7 from all apps into a central file called app\_measurement.db, which is periodically uploaded to  
8 Google’s servers. Google does this because it saves battery and reduces network data costs for  
9 users, whose devices would otherwise be initiating more uploads every day. On iOS devices, this  
10 is not possible, so each GA-for-Firebase-enabled app periodically transmits the data to Google’s  
11 servers individually.

12 In all cases, data is first logged by GA for Firebase, recorded on the user’s device in the  
13 appropriate file, and then subsequently uploaded to Google servers.

14 **4. Consent Checks and Technical Barriers to Joining**

15 HitBundles are received by Google at a “collection endpoint,” where the data is stored in  
16 short-term memory. Before any data is ever written to disk, the server completes several important  
17 steps designed to protect user privacy. The first step is to check if the customer has enabled  
18 Google Signals. Everything described below regarding data duplication and consent checks is  
19 gated on whether the customer has enabled Google Signals. If the customer hasn’t enabled Google  
20 Signals, the HitBundle is treated purely pseudonymously.

21 A preliminary step before the consent check occurs is data duplication. A single copy of  
22 the data packet received from a user’s mobile device is made. This is done to facilitate the  
23 eventual data logging that respects user consent choices. One copy could become tied to a user’s  
24 account if consent checks permit it; the other will become a pseudonymous log. During this time  
25 period, the copies are stored in short-term memory. The time between receipt and logging is  
26 typically less than five minutes.

27 Then, Google checks to see if a user is signed into their Google Account and whether they  
28 have opted into certain privacy controls, namely: the supplemental checkbox under the WAA



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1 control (sWAA), which can only be turned on if WAA is also turned on; Google Ads  
2 Personalization (GAP); and the supplemental checkbox under the GAP control (NAC). Each of  
3 WAA, sWAA, GAP, and NAC are account-level Web & App Activity and Ads Personalization  
4 controls. If sWAA, GAP, and NAC are all turned on, the result of the consent check is that the  
5 data can be tied to a user’s Google account in what is known as “GAIA space.” If any of these  
6 controls are off, then the data isn’t joined to a user’s Google account, and therefore not logged in  
7 “GAIA space.”

8 The consent check actually happens in several steps, all in short-term memory, before any  
9 data is written to disk, *i.e.*, stored: (a) data is received at Google’s servers and, if Google Signals is  
10 enabled, it is duplicated to facilitate logging; (b) Google uses a server to check whether a user is  
11 logged into a Google Account and whether consent has been given to join data to the account (the  
12 sWAA, GAP, and NAC settings discussed above); and (c) the data sets are cleaned and some data  
13 is regenerated to add additional obstacles to joining data.

14 To do this check, Google uses a DSID (IDFA on iOS). It tells Google who the user is by  
15 checking the DSID, which is an encrypted GAIA identifier. There will be no DSID in the  
16 HitBundle if the user is not signed into a Google Account. On iOS devices, the IDFA is associated  
17 with GAIA when users have logged into their Google Account and have not limited ad tracking.  
18 Google also checks to make sure the app developer consents to the tying of GA for Firebase data  
19 to users’ accounts.<sup>5</sup>

20 Importantly, the Google server that receives the HitBundle, called [REDACTED], cannot decrypt  
21 the DSID. This is by design. Instead, [REDACTED] must send the encrypted DSID to a different Google  
22 server that performs the consent check and then returns to [REDACTED] either a “no consent” signal, or an  
23 encrypted GAIA ID. As a result, the hit bundles in short term memory on the [REDACTED] server cannot  
24 reflect a user’s identity until a “yes consent” signal is received from a different server, which itself

25  
26 <sup>5</sup> See

27 [https://www.google.com/url?q=https://support.google.com/analytics/answer/7532985?hl%3Den%23zippy%3D%252Cin-this-article&sa=D&source=editors&ust=1623176595926000&usg=AOvVawlv59Uqg6gqH\\_XGgl4Z76xO](https://www.google.com/url?q=https://support.google.com/analytics/answer/7532985?hl%3Den%23zippy%3D%252Cin-this-article&sa=D&source=editors&ust=1623176595926000&usg=AOvVawlv59Uqg6gqH_XGgl4Z76xO).  
28

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1 never receives the measurement data logged by GA for Firebase. All of this occurs in short term  
2 memory. The upshot of this is that the physical machine that receives the encrypted DSID from  
3 user devices isn’t able to decrypt it, and the physical machine that decrypts the DSID doesn’t  
4 receive the measurement data, it only gets the fields that can be used to check identity. This is all  
5 done to make it even less possible that a bad actor could infiltrate Google’s system and perform an  
6 unauthorized “join.”

7 If any aspect of the consent check fails, the user data is not stored in GAIA space, and the  
8 DSIS/IDFA is deleted.

9 After the consent check is completed and data is duplicated into two logs, Google removes  
10 data from each log to prevent “joining,” which is a technical term that refers to re-identifying  
11 pseudonymized users by joining data from disparate parts of data held by Google together.  
12 Google takes a number of steps throughout its organization to prevent unauthorized joining of user  
13 data, and employees are, generally speaking, barred from doing it. Encryption is used to prevent  
14 Google personnel from identifying the data without authorization. Decryption keys are tightly  
15 controlled, and destroyed after a set period of time, making it impossible to re-join the data.

16 From the signed-in GAIA copy of data, Google removes all pseudonymous identifiers.  
17 From the signed-out pseudonymous log, Google removes all signed-in identifiers. The result is  
18 that the two logs don’t overlap identifiers that could be used to join the logs together.

19 Google additionally regenerates data to prevent deterministic joining. A “deterministic”  
20 or “probabilistic” join would allow a complicated algorithm to use brute force and probability to  
21 guess which data belongs to which person. While the data is still in short term memory, Google  
22 creates “fuzziness,” or slight errors, in data to prevent this. For example, Google adds random  
23 error into timestamps so they can’t be matched together with timestamps elsewhere.

**5. Differentiated Logging**

24 Pseudonymous short-term logs have a 56-day retention period. They store the  
25 pseudonymized copy of the user interaction data—that is, they don’t contain any identifying  
26 information, so it’s not possible to tell to which user the event data belongs. They are used to  
27  
28

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1 create aggregated event data logs for customer use. GAIA short-term logs contain the same event  
2 data but keyed to a specific user.

3 To ensure that joining is practically impossible, Google takes several steps to scrub these  
4 logs of data that overlaps with data in other logs. Pseudonymous logs don’t contain GAIA IDs.  
5 GAIA logs don’t contain Device ID or app\_instance\_id. Both logs do contain aeid, or Ad Event  
6 ID, but in the pseudonymous log, aeid is encrypted with a 6-day retention key that is different  
7 from the encryption key used to encrypt Ad Event ID in GAIA logs. Further, in GAIA logs, aeid is  
8 “salted” as well, meaning random data is added to it to make it even harder to match it to the aeid  
9 stored in pseudonymous logs. As a practical matter, connecting these to each other is impossible.

## 10 6. Google’s Encryption Technology

11 As further background, Google’s encryption technology creates new encrypted keys every  
12 day. This enables the encryption keys to be retained for a fixed period (for example 60 days) of  
13 time for decryption purposes. Once the period of time passes, the keys are deleted, making  
14 decryption impossible. GA for Firebase also uses a different encryption key for the same user ID  
15 in GAIA space as compared to pseudonymous space (and in the case of aeid, in AdMob  
16 space). For that reason, it is prohibitively expensive to decrypt data from one log (e.g.,  
17 pseudonymous) and join the data with another log.

18 For a set period of time, some IDs (device ID, app instance ID, and ad event ID) are stored  
19 and encrypted to allow Google to account for possible delays in data transmission and to fix any  
20 errors in data processing, including at customers’ (i.e., app developers’) request.

21 *Device ID and app-instance ID* are stored in encrypted form for 60 days. The reason the  
22 keys are stored for 60 days is because there are sometimes errors in the logs that require  
23 reprocessing of data. The 60-day window allows for customers to request reprocessing. It also  
24 allows Google to scan the logs to determine the amount of data affected by errors, which informs  
25 solutions to code issues. Google personnel are barred from using these keys without authorization,  
26 Google has monitors in place to ensure such unauthorized use doesn’t happen, and access to the  
27 keys is tightly controlled. As a general matter, humans who work for Google would have no  
28 reason to gain access to these keys, and they don’t. Computers do use them to reprocess data, as

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1 described here, but this happens without humans learning the keys, not unlike swiping a credit  
2 card at a grocery store.

3 *Ad event IDs* are stored in encrypted form for 6 days. These IDs are specific to a user’s  
4 particular interaction with an ad. Ad event IDs allow Google to expand the Google Analytics  
5 pseudonymous data set with data from ADMob logs *if* the user has provided the proper  
6 permissions. Where a user interacts with a product that uses AdMob, that interaction is stored in  
7 AdMob logs and that data is joined to the Analytics data set using the ad-event ID.

8 The encryption keys are retained for 6 days to allow for processing time and errors. The  
9 processing happens daily and in some cases takes a few hours. If reprocessing of the data is  
10 necessary due to some error, the 6-day window allows Google time to do the reprocessing.

11 As discussed above, the ad event ID is the only unique ID common to both GAIA space  
12 and signed-out space that would allow for joining of data to a specific user. This means that for  
13 the 6-day window in which the ad event ID is stored with encryption, it is theoretically possible  
14 for someone with access to both ad event ID encryption keys to join data.

15 Google takes several steps to ensure this does not happen. As described above, Google  
16 generates new encryption keys each day and it uses a different key for the same user ad event ID  
17 in GAIA space as compared to pseudonymous space. Access to the encryption keys is tightly  
18 controlled and even the teams of engineers that create the code for GA for Firebase and related  
19 products/services do not have access to the keys. Google also protects the code that requires use  
20 of encryption keys. Once the 6-day period has elapsed, it is not possible for Google (or any other  
21 bad actor) to rejoin data stored in the pseudonymous logs with a user profile using the ad event ID.

22 Further, Google uses a restricted need-based access process and audit procedure. To begin,  
23 Google supports tiered access to the logs stored by GA for Firebase. None of the tiers includes  
24 personally identifiable information, but the default access level, for example, includes only event  
25 data, so Google employees cannot see any identifiers at all. Querying a log past the default state  
26 (i.e., geolocation logs or raw logs) requires a request ticket that allows Google to audit and track  
27 the request. Through that system, teams have to explain why they need a specific level of beyond-  
28 default access. Even if such access is granted, Google does not allow access forever. There are

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1 temporal restrictions: access is granted for a certain time frame after which teams will need to re-  
2 request access.

### 3 **7. Use of User Data by Customers**

4 User data is made available to external customers from whom the data originally was  
5 transmitted so they can conduct analytics and other marketing campaigns. The measurement data  
6 collected by Google Analytics for Firebase is used to provide Google customers with insights on  
7 app usage and user engagement. GA for Firebase allows sharing Analytics data with Google for  
8 improving Google products and services, enabling technical support, benchmarking, and sharing  
9 with Account Specialists. More on how shared data is used is [here](#).

10 When data is reported to app developers, it is done so on an aggregated level. After  
11 pseudonymous logs are created, a subset of the data in them is then used to create the database for  
12 the back-end of GA for Firebase that feeds customers with reports. None of the ID data in that  
13 database overlaps with data in GAIA space, so no joining between them is possible. Both datasets  
14 do include event data, however, though timestamps are made “fuzzy” to prevent joining, as  
15 discussed above.

16 Raw event data may be exported to BigQuery for custom analysis. Google Data Studio  
17 can leverage raw Analytics event data through its BigQuery connector, which facilitates the  
18 generation of custom reports using Analytics events, parameters and user properties.

19 Users can adjust their data sharing settings in the [Analytics Settings](#) section in the  
20 Analytics UI.

21 Google only collects measurement data for apps that have the GA for Firebase SDK built  
22 in. Google’s customers can obtain consent from end users to collect data. GA for Firebase  
23 customers can opt out of data collection according to the mechanisms discussed [here](#).

### 24 **8. Use of Pseudonymous User Data by Google**

25 Subject to the data sharing setting “Share with Google to improve products and services,”  
26 Google uses user data collected via GA for Firebase across teams for product development,  
27 improvement, and diagnostics. As discussed above, Google can also use pseudonymous event data  
28 from GA for Firebase logs to target advertising to users, all without personally identifying the

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1 user. Users can opt out of such ad targeting on their device by opting out of ad tracking on their  
2 Android or iOS device.

3 With regard to the other products and features that are part of Firebase SDK that may  
4 collect overlapping pieces of data, such as device model, app updates, and other types of data,  
5 such functionality is publicly documented including on Google’s public help center pages at  
6 GOOG-RDGZ-00013288 - GOOG-RDGZ-00013449, which can also be viewed at  
7 firebase.google.com and support.google.com.

### 8 **9. Data Storage and Access – Client-Side**

9 Analytics data is stored in sqlite database on the device. The database is private and only  
10 the application has access to it. On Android Play devices the database is stored inside the GMS  
11 core services (aka Google Play Services) and the application doesn’t have read access to the  
12 database. It can only use the client API to write to the database.

13 The local database stores the temporary raw events until they are uploaded to the Analytics  
14 collection endpoint. On successful upload the raw events are deleted from the local database.  
15 When the app fails to upload the raw events in 4 weeks data the data is discarded.

16 The local database also stores the user properties, the next sequential number for each  
17 event name, the timestamp of the last logged event and last set user property and the next  
18 sequential bundle index. Analytics data is uploaded in bundles that contain the current user  
19 properties, set of events that happen and app/device metadata.

20 Uninstalling the app clears all Analytics data. Any queued up data for uploading from the  
21 app might be uploaded after the app is uninstalled. Data queued up for uploading for more than 4  
22 weeks will be discarded.

23 Uninstalling and reinstalling the app appears as a new fresh installation for Analytics. All  
24 existing data from the previous installation, including app\_instance\_id, is deleted. Calling  
25 resetAnalyticsData manually has the same effect.

### 26 *Measurement Processing Pipeline*

27 The Google Analytics for Firebase pipeline can be broken down into multiple components:  
28 event ingestion, event widening, event processing, aggregation and query serving. Event ingestion

HIGHLY CONFIDENTIAL – ATTORNEYS’ EYES ONLY

**11. Data Deletion**

Analytics Measurement data follow the Analytics standard retention policy. Some of the key default storage retention periods in GA for Firebase include:

- Collection logs: 8 weeks
- Event ingestion output: 4 days
- Raw baseview: 60 days
- Aggregates: Kept indefinitely

**INTERROGATORY NO. 2:**

Please identify every app that includes or has included Google’s Firebase SDK since the start of the Class Period, including for each app the time period during which that app used Google’s Firebase SDK and Google therefore would have received data even when users had Web & App Activity turned off (or previously paused).

**RESPONSE TO INTERROGATORY NO. 2:**

Google objects to Interrogatory No. 2 as vague and ambiguous as to the undefined term “Web & App Activity.” For purposes of this response, Google construes Web & App Activity to mean the account-level setting called Web & App Activity. Google further objects to this Interrogatory as vague and ambiguous with respect to the phrases “Google therefore would have received the data” and “Firebase SDK.” Google further objects that the definition of “Class Period” is vague and ambiguous, as the Interrogatories define the term to mean “the class period in this case, as defined in the operative complaint,” when the “operative complaint” has changed between when the Interrogatories were served and when these responses were provided, and the definition of “Class Period” differs between the original and amended complaints. Google further objects that the term “Class Period” is vague and ambiguous because it fails to provide a concrete range of time. Google further objects to this Interrogatory to the extent that it seeks information protected by the attorney-client privilege and/or the attorney work product doctrine. Google further objects to this Interrogatory because it is unduly burdensome, overbroad, and disproportionate to the needs of the Action, as it seeks a list of every app that includes or has

# Appendix A-14



## App Attribution in GAA

go/apps-in-gaa

PRD: 06/2020; author: chuyi

### Background

App campaigns are a type of campaign, like Search or Video campaigns. These campaigns are typically run by app developers to drive conversions such as installs or in-app engagement. The ads these campaigns run can appear in search results, in Gmail, on the Play store, the GDA network, or YouTube, or even within other apps.

App attribution is a bit different from web attribution. In place of cookies or image pixel tags are SDK<sup>1</sup> identifiers, advertising IDs<sup>2</sup>, referrers<sup>3</sup>, click data, and other information. Since users engage with apps over a period of time, there's also added emphasis on lifetime value when it comes to app attribution.

Our thinking on app attribution is still evolving. For the perspective of the App ads team, refer to [this PRD](#) or [this strategy deck](#). See [here](#) for detailed notes around bringing apps to Google Ads Attribution (GAA) and [here](#) for a design doc around app attribution in [REDACTED]

For an engineering view of the requirements, see [here](#).

### Objective

Broadly, our goal is to offer consistent and compelling attribution features in Google Analytics and Google Ads to app-developer advertisers.

In the next year, we want to support multi-touch attribution (MTA) for app conversions in Google Analytics and Google Ads. Today, attribution in these two platforms is last-click based.

This means we'll need to expand Google Ads Attribution's support of conversion types beyond website conversions<sup>4</sup> to cover app conversions. Though the majority of app conversions flow through third-parties (3Ps), our discussions here primarily focus on first-party (1P) data, meaning conversions tracked by our own Firebase SDK (also known as GA4F SDK) and imported from Google Analytics.

---

<sup>1</sup> SDK stands for Software Development Kit, an installable package that provides tools and libraries for developers to write code more easily.

<sup>2</sup> IDFA on iOS, ADID on Android. These are unique and device-specific, and can be reset.

<sup>3</sup> Android only.

<sup>4</sup> Today, GAA reads website conversions from Google Ads (AWCT) and Google Analytics.



[REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

#### The user journey

1. An app developer has an app they want more people to install and engage with.
2. They buy and set up ad campaigns in Google Ads<sup>6</sup> that promote installs of their app and in-app actions<sup>7</sup>. These campaigns can be app campaigns (covered here) or generic “Appify” campaigns (e.g., Search) that deep link into apps (see [here](#) for the journey in that case).
3. In order to know if their ads are working, the developer chooses a software-development kit (SDK) and writes some code using it to track when install or in-app conversions happen.
4. The developer sets up the SDK to ping a Google Ads API each time there’s a conversion. When Google Ads receives a ping, it responds with a postback containing information about the most recent Google ad interaction preceding the conversion. The SDK also does this with other platforms (e.g., Facebook) to learn about ad interactions that happen on non-Google properties.
5. The SDK, whether Firebase (Google Analytics) or another third-party App Attribution Platform (AAP), adjudicates between the ad interactions it learns about from different networks (e.g., Google Ads, Facebook, other ad networks), computes credits for each interaction, and logs these credits on its platform.
6. If the SDK determines that the last click belongs to Google Ads, it sends us a (conversion, ad interaction) tuple<sup>8</sup> to indicate that we get credit for the conversion. If the SDK determines we were not the last click, it’ll send a ping confirming that Google Ads didn’t win the last click attribution (along with additional information like what other ad platform received credit or what

**Commented [1]:** @msiska [REDACTED] This user journey seems to be ACx specific. Do we want to update it to account for appify?  
Assigned to Meng He

**Commented [2]:** Yeah, feel free to add some suggested edits!

**Commented [3]:** I have added a session with a link to the DDA for Appify (2-pager), where the details reside.

**Commented [4]:** Thanks! Using your suggested edits, I’ve updated bullet #2.

To clarify, what campaign types work with Appify? Search, YT, GDA, all?

**Commented [5]:** Hey @satvik [REDACTED], thanks for the suggestions. Based on your suggestions, I think the point I was trying to make was getting lost, so I rewrote this to be clearer. Does this look good to you now? Thanks!  
Assigned to Satvik Chauhan

<sup>5</sup> “Ads-preferred” refers to an attribution approach that distributes conversion credits only across Google properties.

<sup>6</sup> Advertisers provide assets, a target bid, and a budget, and specify geo and language targeting settings.

<sup>7</sup> Examples: buy coins, redeem points, make reservation, obtain quote, schedule service, open account, et al.

<sup>8</sup> [REDACTED]

business logic the advertiser set on the AAP side that caused Google's ad event to be ineligible for credit).

7.

[REDACTED]

Here's a visual for the data flow:



Learn more about the fundamentals of app campaigns [here](#).

### Attribution

App attribution is complicated in part because it's fragmented. Consistent Conversion Measurement (CCM) refers to our large effort to consolidate conversion tracking and processing.

There are a variety of SDKs advertisers can choose from to track conversions<sup>9</sup>. Today, 80% of app conversions are tracked using non-Google SDKs. We prefer advertisers use our 1P Firebase SDK<sup>10</sup>, as this tends to give us better data for constructing multi-touch point conversion paths. Poor conversion coverage means there are fewer conversions to tie ad interactions to and spottier attribution.

<sup>9</sup> AppsFlyer, Joust, Kochava, and Firebase are some of the bigger names.

<sup>10</sup> The effort to drive Firebase adoption is called [REDACTED].

**Commented [6]:** @satvik [REDACTED] I thought this may be AAP specific; is that correct?

**Commented [7]:** most AAPs do this. Correct the language a little bit.

**Commented [8]:** Thanks! Curious: what information is contained in the "why Google Ads wasn't the last click"?

**Commented [9]:** It mostly around 1. Other network won the attribution 2. Event wasn't eligible due to advertise settings on the AAP side like windows or some other business logic.

**Commented [10]:** Thanks! Updated the language in parentheses here.



Developers tracking conversions using the Firebase SDK can see their app conversions in the core Google Analytics reports today (Analytics' Attribution reports are expected to start showing app conversions in Q1 2021). These developers can also link Google Analytics with Google Ads to see their conversions in Ads reporting.

However, advertisers will need to use the Firebase SDK if they want to employ automated bidding in Google Ads.

There are four types of automated bidding<sup>13</sup> app developers can use to optimize for user actions:

tCPI, tCPA (the only bidding type for ACe campaigns), . The ones with \*s are in beta.

Side note: Analytics is a wrapper around the Firebase development platform. App conversions tracked by Firebase SDKs are sometimes referred to as Firebase conversions.

Since conversions are most frequently defined as an app install or some form of in-app engagement (e.g., a sign-up or purchase), app campaigns are categorized as App Campaigns for Installs (ACi) or App Campaigns for Engagement (ACe)<sup>14</sup>. These are known as sub-campaign types. ACi campaigns always lead to an app store, and ACe campaigns open the app (or fallback to the app store if the app is not installed<sup>15</sup>).

There are three types of conversions<sup>16</sup>.

<sup>11</sup> Google Analytics today and going forward will only support its own Firebase SDK. This is part of the strategy.

<sup>12</sup> This is described in the user journey section above.

<sup>13</sup>

[https://docs.google.com/presentation/d/1e34wkeWcB73B9u0gTvWk7nSwdZvrZLw0HCLMBB11Ugk/edit?hl=en&slide=id.g8e3be08af5\\_0\\_2567](https://docs.google.com/presentation/d/1e34wkeWcB73B9u0gTvWk7nSwdZvrZLw0HCLMBB11Ugk/edit?hl=en&slide=id.g8e3be08af5_0_2567)

<sup>14</sup> There is also ACPre, a sub-campaign type intended to generate demand for an app before its release.

<sup>15</sup> This is an edge case, since we try to avoid serving ACe campaigns to users who don't have the app installed.

<sup>16</sup> Source [here](#).

**Commented [11]:** Currently, we agreed with @ohnlicher that GAA won't cover 3P AAPs as App Ads strategy is to move them all to SDK (Google 1P SDK) as per . May be good to update this accordingly.

**Commented [12]:** I see. Does Google Ads support 3P AAPs today? It had sounded from [1] like Yes. So we would be removing support then for all SDKs except for Firebase SDK?

[1] [https://docs.google.com/document/d/1JLZDbKYOLSiZG\\_JEk3J7v3BZ-ZISpTIBEvqdbZQX\\_P/edit?hl=en&disco=AAAAGISK9QI](https://docs.google.com/document/d/1JLZDbKYOLSiZG_JEk3J7v3BZ-ZISpTIBEvqdbZQX_P/edit?hl=en&disco=AAAAGISK9QI)

**Commented [13]:** Yes for supporting 3p. No to removing support for 3p. We will require firebase SDK.

**Commented [14]:** Cool, thanks, I've updated the

**Commented [15]:** @guoling FYI.

**Commented [16]:** This may be a bit misleading since

**Commented [17]:** Agree, advertisers can (and usual

**Commented [18]:** I see. Can all 3 sources be

**Commented [19]:** That I dont know.

**Commented [20]:** Okay, could you clarify what you

**Commented [21]:** Minor clarification. Anton is on App

**Commented [22]:** Whoops, sorry about that!

**Commented [23]:** re:AAP- correct but on Google Ad

**Commented [24]:** yes GA supports conversions only

**Commented [25]:** >> yes GA supports conversions

**Commented [26]:** What do we mean by 3p data? 3p

**Commented [27]:** Ads will still use conversion pings

**Commented [28]:** Right, for LC attribution app ads w

**Commented [29]:** Makes sense

**Commented [30]:** +1 to the above.

**Commented [31]:** +balachandaro

**Commented [32]:** Currently we don't yet have 3p AA

**Commented [33]:** Currently, we agreed with

**Commented [34]:** I see. Does Google Ads support

**Commented [35]:** Yes for supporting 3p. No to

**Commented [36]:** Cool, thanks, I've updated the

**Commented [37]:** @guoling FYI.

**Commented [38]:** eCPC also accounts for conversio

**Commented [39]:** Not sure I follow - mind clarifying



**CLICK-THROUGH  
CONVERSIONS**

Based on a click, within a 30-day window on all AC ad formats



**VIDEO  
ENGAGEMENTS**

When a user watches a video ad for more than 10 seconds, and converts within a 2-day window (ACi) or 1-day window (ACe)



**VIEW-THROUGH  
CONVERSIONS**

Based on a viewable impression, >50% on Screen >2 sec within a 24-hour window and on all ACi ad formats, excluding Search channel

There are dependencies between different types of app conversions (e.g., in-app conversions can only happen after install conversions). [REDACTED] sets out to bring more reflective credits for install-focused campaigns when users convert through in-app engagements after installation. This project has an expected impact of +\$XXM ARR. Data-driven attribution (DDA) will take a machine-learning approach to dealing with these dependencies instead of applying [REDACTED] duplication logic (e.g., pre-install checks). However, [REDACTED] is applied automatically to last click attribution.

**Commented [40]:** @chuy [REDACTED] I'm not sure I would characterize [REDACTED] in this way. [REDACTED] is really cross-campaign duplication of credit, not DDA. @beckermar [REDACTED]

**Commented [41]:** Agree. [REDACTED] is an intermediate step and would become one of the use cases of DDA in the future, but in itself it is in no way DDA.

**Commented [42]:** I had taken the word of the PRD review presentation linked here - sounds like I might have misinterpreted. Reworded based on your input. Thanks!

**Commented [43]:** We had some discussions on these topics before. The notes are here -- [https://docs.google.com/document/d/101y8mnj7oWW4VKHRdKAigAJ6Z4xwo3IElvPQUKJF\\_Sc/edit#heading=h.bcy0moi8v00g](https://docs.google.com/document/d/101y8mnj7oWW4VKHRdKAigAJ6Z4xwo3IElvPQUKJF_Sc/edit#heading=h.bcy0moi8v00g).

Apologies that you were not in these discussions. I am happy to sync with you f2f if it helps.

For now we said that for DDA, we will not apply pre-install check or do duplication like [REDACTED] as DDA will address them directly. @johnicher [REDACTED]

**Commented [44]:** Ah, no problem and good to know - added clarification here. Thanks for helping keep this accurate!

Appify also comes up frequently in this context. Appify is not a campaign type but rather a technology layer that allows Search, Shopping, and GDA campaigns to deep-link into apps using URLs. This is a strategically important way to drive app conversions and therefore part of the app attribution story. App conversion tracking is complex since conversions can occur either on an app's mobile website (no deep link) or in the app itself (Appify deep link).

Appify works when an advertiser sets up app links (Android, iOS). When app links are set up, mobile users who click on an ad with a URL landing page are not prompted to choose how to open the link but are instead taken directly to the advertiser's app. Mobile users who don't have the advertiser's app installed and users on Desktop are directed to the advertiser's website.

App ad interactions like clicks, engaged views<sup>17</sup>, and playable views<sup>18</sup> are logged in [REDACTED]. These interactions can happen on a range of surfaces, since app ads can appear in many places.

Here's a system diagram showing how app data comes together for attribution:



#### **Key facts, considerations, and points of discussion**

- As with any other form of attribution, coverage of both ad interactions and conversions is critical. We realize we may never have the complete picture here. Here's a diagram of the app conversion flow:

---

<sup>17</sup> User watched the video for 10 seconds or until the end.

<sup>18</sup> User watched the video for less than 10 seconds.





- With the exception of app installs, “app conversions” refer to conversions that happen within an app on a mobile device.
- Google Analytics in the future may only support Firebase SDK, per our [REDACTED] strategy. Today, we recommend advertisers “dual tag,” meaning that they use both our Firebase SDK and an AAP.



- Google Analytics today only supports last click attribution and uses a fixed lookback window<sup>19</sup> of 180 days. There’s an open question about what other lookback windows we should support for different interaction types. [REDACTED]

[REDACTED]

- [REDACTED]

<sup>19</sup> More about lookback windows here:  
[https://docs.google.com/document/d/15hkRX6yxo5HfvXiFyorlaUmz7tDlxQfTek\\_S1elvz90/edit?hl=en#bookmark=id.2w45gl2tzs4j](https://docs.google.com/document/d/15hkRX6yxo5HfvXiFyorlaUmz7tDlxQfTek_S1elvz90/edit?hl=en#bookmark=id.2w45gl2tzs4j).

**Commented [45]:** On the Ads side, @beckerman [REDACTED] is leading a project to introduce configurable lookback windows for different interaction types.

**Commented [46]:** Kechy and I discussed Project Windows and its implications on [REDACTED] at length :)

**Commented [47]:** Heh, she alluded to those when I chatted with her, too. What would you say makes this problem most difficult? Is it that there are different opinions about what the right lookback windows are, or that some systems have deep-baked assumptions around lookback window lengths, or something else?

**Commented [48]:** I think just the fact that we have different window types and offered window ranges that affect our optimization and attribution both in Ads and in 3P AAPs. Changing windows, introducing new windows, etc. is very complicated.

- There are two specific questions:

1. What lookback window requirements does the [REDACTED] team have for Apps training data?
  - Decision: Use a [REDACTED] for training instead of [REDACTED] (the default in [REDACTED]) for now.
2. There are a few places lookback windows are relevant in Ads. GAA supports Default, [REDACTED] windows in its reports. In AWCT / core Ads reports, we honor the conversion windows set by the user. What work is needed to support these use cases?
  - [This is still being investigated.]
  - We will not train on or report app conversions whose last click falls outside the advertiser's configured conversion window (the logic is a bit custom, as described [here](#)). In other words, when advertisers select a preset lookback window of [REDACTED] in their reports, the conversions reported only include those with a last click within the advertiser's configured conversion window. This is aligned with how GAA handles web conversions today. (The reason behind it is that conversions without a last click within the conversion window are eligible for conversion modeling. We wouldn't want to include an observed conversion of this kind, only to have it modeled too.)

- Google Analytics is working to support x-network data-driven attribution, which would attribute credits to non-Google sources. These credits will be stored in the JACCC logs and used exclusively by Google Analytics (not by Google Ads).
- When Google Analytics exports conversion credits to Google Ads, it's always on a last click basis. For website conversions today, Google Analytics exports x-network last click credits to

**Commented [49]:** @shuang [REDACTED] and @qinghua [REDACTED] to formalize as needed!

**Commented [50]:** I had some discussion with Qinghua, and so far, we agree on not reporting/training on a conversion if its last click is out of the user configured LBW, even if a click might be within the [REDACTED]. This is the current behavior for GAA web, and I prefer keeping the same behavior for App. The reason for not including such a conversion for reporting/training is that this conversion eligible to be used in conversion modeling in Ads. If this conversion ends up being modeled, then we might report it as two conversions in some LBWs, one is observed, the other is modeled.

**Commented [51]:** That makes a lot of sense - thanks for the explanation. Is there still a question that we should track here, then, or should we consider question #2 resolved?

**Commented [52]:** Question for Shuang: >> not reporting/training on a conversion if its last click is out of the user configured LBW. So if the last click is an EV, we use EV LBW and if it is a physical click, we use CTC, is that correct? what if the last click is an EV which is outside of EV LBW, but we still have a physical click within CTC LBW?

**Commented [53]:** This conversion is also filtered.

**Commented [54]:** Wenjie, was the thinking behind your question to see if the rule here [1] was applied?

Shuang, I tried to document this comment here

**Commented [55]:** >> was the thinking behind your question to see if the rule here [1] was applied? No, these conversions will not be seen by aggregation

**Commented [56]:** [2] LGTM.

**Commented [57]:** FYI, this is only for x-channel DDA exports. The Google Ads preferred DDA (currently done through GAA path for web but proposed to be

**Commented [58]:** Thanks for clarifying this, Bala. @hetal [REDACTED], how should I reconcile what Bala's flagging with what we talked about last week?

**Commented [59]:** I think what Bala is saying is inline with what we discussed last week. I think it might help to add a bullet point here saying that we will also

**Commented [60]:** FYI, this is only for x-channel DDA exports. The Google Ads preferred DDA (currently done through GAA path for web but proposed to be

**Commented [61]:** Thanks for clarifying this, Bala. @hetal [REDACTED], how should I reconcile what Bala's flagging with what we talked about last week?

**Commented [62]:** I think what Bala is saying is inline with what we discussed last week. I think it might help to add a bullet point here saying that we will also



Google Ads. These can be thought of as (conversion, ad interaction) tuples, and conversions without a corresponding click are not sent.

- For website conversions, Google Ads performs conversion modeling ( [REDACTED] ) on this data to infer ad interactions we may have missed. This modeling sometimes infers an ad interaction that should receive last click credit for a (currently unattributed) conversion. This ad interaction is then joined to other, earlier ad interactions to form a path. (On Search and GDA, modeled data makes up a small fraction of total conversions. On YouTube, modeled data can make up a decent fraction though is still the minority.)
- For app conversions, we'll follow a similar pattern: Google Analytics will emit (conversion, ad interaction) pairs to Ads [REDACTED] based on last click attribution. Ads will model on top of this to generate modeled conversions [REDACTED]. GAA will then consume Google Analytics collection logs, [REDACTED] and [REDACTED] to build multi-touch paths and send these paths to [REDACTED]. [REDACTED] on [REDACTED] will then generate attribution credits (for all 6 models) used for GAA and AWCT reporting and bidding. The official system of record for the design is [here](#). The following is just a sketch of the process.
  - Both Google Analytics and AAPs already export app conversions on a last click basis — that is, (conversion, ad interaction) tuples. This is the key input to Google Ads and will not change.
  - We'll need to expand the limited app conversion modeling we do today. [REDACTED]
  - In 2021, in addition to [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
  - As of August 2020, it was decided that the data processing for Ads-preferred DDA credits will happen on Google Analytics infrastructure ( [REDACTED] on [REDACTED] ) but will only be surfaced in Google Ads Attribution reporting.
  - UI, aggregation, and serving will be done on the Google Ads side.
  - Beyond 2021, Google Analytics may surface these credits in Analytics reports as well.
- In the case where one [REDACTED] property is linked to two Ads accounts that track conversions separately, we can think of the behavior as follows:

**Commented [63]:** @dent [REDACTED], do you know if Google Ads uses Google Analytics' credits or still computes its own and uses that for reporting and bidding?

Assigned to Chris Teng

**Commented [64]:** Google Ads also uses its own when it comes to Google Analytics as a conversion source.

**Commented [65]:** Heh, so interesting Thanks!

**Commented [66]:** For google analytics, app conversions, we ping over the unattributed conversions to BOW and let EventFe do the ads preferred LC attribution. This flow is different to export of web conversions from [REDACTED], where we export only conversions attributed to Google Ads via LC X-channel model

**Commented [67]:** Ah, sounds like \_Attribution modeling is baked into the credits received by Google Ads\_ isn't correct, then. Rather, the conversions "sent to Google Ads" is conversion-model agnostic?

**Commented [68]:** @ctend [REDACTED], do you know if Google Ads uses Google Analytics' credits or still computes its own and uses that for reporting and

**Commented [69]:** Google Ads also uses its own whe...

**Commented [70]:** Heh, so interesting. Thanks!

**Commented [71]:** For google analytics, app

**Commented [72]:** Ah, sounds like Attribution

**Commented [73]:** LC credits are stored in JAC lo

Commented [74]: @clend [REDACTED], do you kno...

**Commented [75]:** Google Ads also uses its own whe...

**Commented [76]:** Heh, so interesting. Thanks!

**Commented [77]:** For google analytics, app

**Commented [78]:** Ah, sounds like `_Attribution`

Commented [79]: @cleng [REDACTED], do you know ...

**Commented [80]:** Google Ads also uses its own whe...

**Commented [81]:** Heh, so interesting. Thanks!

**Commented [82]:** For google analytics, app

**Commented [83]:** Ah, sounds like `_Attribution`

Commented [84]: @pensadov... this

**Commented [85]:** It is a shared [REDACTED]

**Commented [86]:** Hey all, as a follow up to this

Commented [87]: @kellynelson [REDACTED] and [REDACTED]

**Commented [88]:** Lgtm, the summary looks accurate

**Commented [89]:** LGTM

**Commented [90]:** lgtn, thanks for writing this!

- [REDACTED]
- [REDACTED] and GAA share the same processing pipeline, whereas GAA web uses a separate pipeline.
  - Here's a diagram showing the expected difference in attribution modeling when comparing Ads-preferred data-driven attribution (new) with Ads-preferred last click attribution (current):



- There are and will likely continue to be nuanced differences between how Google Ads and Google Analytics does attribution, from the ID space used to the modeling itself. See [here](#) for more details.
- Google Ads will continue allowing developers to send 3P SDK data. Android developers can also use Android Codeless Install Tracking to send app downloads from Google Play directly to Google Ads<sup>20</sup>. This data just won't be usable for bidding.
- On the Incrementality front, conversion lift has been commercialized [REDACTED]. This data has yet to be employed by [REDACTED].
  - We have data around the uplift of ads in GDA, YouTube, Google Play, and AdMob.
  - We do not have conversion lift data for apps in Search.

<sup>20</sup> Learn more [here](#).

**Commented [91]:** If an app conversion is split into two different Ads accounts and therefore two different Path reports, is there any way to at least flag when a path step is fractional?

**Commented [92]:** There are ways we could show this for sure (we do in Google Analytics, [REDACTED]), but it'd require some careful design and probably medium amounts of implementation work, so I'd probably lean toward going this route only if needed. Do you think messaging via the UI, Ads HC, etc. could be a solution?

**Commented [93]:** It could be for sure - I guess it depends on how common this issue will be.

**Commented [94]:** [REDACTED]

@kechyeke [REDACTED], is that right?

**Commented [95]:** [REDACTED]

**Commented [96]:** I think it is feasible to use a flag to indicate that the path is a part of a longer paths. In backend, we can have a dimension to indicate that this path is split from another path. However, it will be difficult to provide more detailed stats, e.g. the length of the original path.

**Commented [97]:** Thanks, Kechy and Wenjie. Given the complexity here even if we wanted to show fractional paths (i.e., the fraction we'd show would be a function of the attribution model), I'm still leaning toward handling this via messaging.

**Commented [98]:** Are there more information about the lift study? How is the TEDDA team consuming the lift data to develop their model?

**Commented [99]:** @cteng ([REDACTED]) would you know or be able to direct? Thanks!

**Commented [100]:** Lawrence would know, but I think it's all conjectural for now. We aren't actually doing anything with [REDACTED] for the lift data.

Right now all of the lift results live with the CL team's tables

**Commented [101]:** Ah, okay.

@lawrencechang [REDACTED] @jiwang [REDACTED] are there plans to use this data that I can document here?



- There have also been live holdback background studies performed on advertiser campaigns.
- App conversions should be attributable to both "Appify campaigns" (meaning: regular campaigns whose landing pages are to apps with app links set up) and AC\* campaigns.
- "Appify campaigns" can lead to / should be eligible to receive credit for website conversions.
- Since AC\* campaigns have selective optimization and lead to an app or app store, Attribution should not attribute credit for website conversions to AC\* campaigns.

**Commented [102]:** Can we rephrase this to "regular campaign clicks which are eligible for app conversion attribution". The definition of app conversion attribution.

**Commented [103]:** Basically, once

**Commented [104]:** Thanks for flagging and makes sense to update this. Only question is whether we can find a less self-referential way of defining this. The point of this bullet is to clarify which campaigns are eligible for credit, so it seems strange to define this as clicks eligible for credit, heh. :-)

- The data sources for app data in [REDACTED] and GAA are:

<sup>24</sup> Context [here](#).



- For last click attribution, GAA will use AWCT last click. This is different from the behavior for Web, where GAA and AWCT use different logic to determine last click (GAA performs the computation server-side by looking at timestamps, whereas AWCT relies on custom waterfall logic).

#### Data-driven attribution (DDA)

- Data-driven attribution is an attribution modeling approach that will have an implementation in Google Analytics and another in Google Ads. In Google Analytics, DDA will attribute credits to multiple networks and platforms. In Google Ads, DDA will allocate credit only among Google properties.
- Google Analytics is currently working on supporting data-driven attribution as one of the forms of multi-touch attribution for both cross-channel and ads-only paths.
- DDA for website conversions already exists in Google Analytics Classic. It is a paid feature of Multi-Channel Funnels (or MCF, available with the Google Analytics Classic UI) and is available for free in Google Analytics' Attribution reports [REDACTED]. Note: Google Analytics Classic is a web only product.
- With the migration from Classic to [REDACTED], we are working on bringing DDA into [REDACTED] as well. This feature is an adoption blocker for the migration.
- [REDACTED] is cross-platform so to ensure a consistent experience for users across app and web, we plan to support DDA for apps as well. In addition to offering a consistent experience, DDA will also help advertisers analyze the path to conversion for apps more holistically (similar to web) and will address the use cases that [REDACTED] is solving for.
- DDA for Apps started earlier this year and we have plans to launch together with DDA for website conversions next year (~Q2 2021).
- Challenges include:



**Commented [105]:** Hey @kechyeke [REDACTED] would you add a few bullets here that give an overview of the key points around bringing DDA to Google Analytics?

Maybe things like:

- When the effort began?
- How far along is it / what milestones we've already hit?
- What are the key challenges?
- etc.
- Assigned to Kechy Eke\_

**Commented [106]:** Charles, I think this PRD is about GAA, not GA?

Probably also add a few bullets for conversion modeling for [REDACTED] and how those interacts with DDA, similar to the GAA YT part, modeled conversions are not used for training, but for attribution, whether it's worth evaluate DDA on modeled conversions etc.

**Commented [107]:** Added some high level bullet point, PTAL.

@lanhuang [REDACTED] maybe it's better to link to a design doc on those details?

**Commented [108]:** @kechyeke [REDACTED] do you mean the YT design documents or app? We haven't started the design for app attribution.

**Commented [109]:** Thanks, Kechy!

>> Charles, I think this PRD is about GAA, not GA?

For sure, yeah. That said, I figured that what GA was up to may play a significant role in decisions on the GAA side.

>> Probably also add a few bullets for conversion modeling for x-device, multi etc, and how those interacts with DDA

Lan, what would be the key points you think we should highlight here for Apps?

**Commented [110]:** [REDACTED]

**Commented [111]:** I see. For now, I've tried to capture this in the Key questions section ([https://docs.google.com/document/d/1JLZDbKYOLsIzG\\_JEK3J7v3BZ-ZISpTIBEvqdbZQX\\_P1/edit?ts=5f10db2d#bookmark=id.lz403uum730g](https://docs.google.com/document/d/1JLZDbKYOLsIzG_JEK3J7v3BZ-ZISpTIBEvqdbZQX_P1/edit?ts=5f10db2d#bookmark=id.lz403uum730g)).

As far as actually making this decision, seems like we



- Initial results (from 12/2020) are [here](#).
- It was decided in Q4 2020 that we would [first launch DDA on Appify](#) (with AC\* on last click), likely in Q3 2021, then subsequently expand DDA coverage to AC\* campaigns. See [here](#) for examples of how Attribution credits will be distributed in various cases.

#### Bidding in Google Ads

TBD.

#### Reporting in Google Ads

- Google Analytics has app reporting in its core reports but not yet in its Attribution reports. App reporting in core reports is unified with web reporting in [REDACTED]. (Adding a filter allows users to segment their app conversions from web conversions.) An example can be seen in the [conversions detail report](#), though this data can be seen throughout other core [REDACTED] reports too.
- Path reports and modeling credits for apps is expected to land in [REDACTED]'s Attribution reports in Q1 2021.
- Google Ads reporting encompasses both core Ads ("AWCT") reporting and reporting in Google Ads Attribution.
- Since the Google Ads Attribution backend will export app credits to AWCT, core Ads reports will be able to show the conversion stats that we compute. [REDACTED]
- In the Google Ads Attribution UI, incorporating apps reporting amounts to a few changes, some required and others optional.
  - a. [P0] Specifically for the ad group dimension, we should report on the reporting ad group and not the serving ad group.
  - b. [P0] We'll increase the scope of conversions to include app conversions, which users can adjust for their reporting using [this dropdown](#).
    - In addition to the two groups we have today (*all actions* and *all biddable actions*), we should add the following four groupings to the dropdown (*example*):
      - *All website conversions*
      - *All biddable website conversions*
      - *All app conversions*
      - *All biddable app conversions*
    - This gives us a total of 6 "predefined" options in the dropdown.
    - We will also update the conversion dropdown so that users can select arbitrary combinations of conversions for reporting (moving from single- to multi-select).

**Commented [112]:** Hey @beckerman [REDACTED] is there anything special about how bidding works in Google Ads for apps that might be worth noting here? Assigned to Anton Beckerman

**Commented [113]:** Adding @qinghua [REDACTED] and @shuangsu@google.com, too, in case there are any key points we should log here.

**Commented [114]:** @kechyeke [REDACTED], could you share a screenshot of some of these reports? Slides or other material welcome too! Assigned to Kechy Eke

**Commented [115]:** Added a screenshot. Let me know if you need more

**Commented [116]:** Thanks! Could you also share a screenshot of apps data in [REDACTED]?

(BTW, when I try to navigate to that page, I see <https://screenshot.googleplex.com/aWOjptBZ4M>. Is there permissions to Google Analytics I need to get to see the account?)

**Commented [117]:** [REDACTED] doesn't support apps since GA Classic didn't support apps. This is the value prop of [REDACTED], measurement across app and web.

**Commented [118]:** >> [REDACTED] doesn't support apps since GA Classic didn't support apps. This is the value

**Commented [119]:** Right. We don't have Attribution/DDA in [REDACTED] yet so Advertisers see their

**Commented [120]:** Got it, thanks!

**Commented [121]:** Hey @msisk [REDACTED], @kechyeke [REDACTED] @beckerman [REDACTED]

**Commented [122]:** @clen [REDACTED]

**Commented [123]:** do you have a list of metrics you plan to support in GAA reporting? LTV is a metric that

**Commented [124]:** The proposal here implies we keep the metrics we have today. So we have path reports

**Commented [125]:** I agree with LTV is important, and the fundamental question is what is the best tool to

**Commented [126]:** Good question on computation. Diff products compute differently but in Gold it's based

**Commented [127]:** Sounds intriguing - LTV does seem like a new sort of insight worth exploring / that

**Commented [128]:** @chuy [REDACTED] in the world of web, is this only limited to biddable conversions of

**Commented [129]:** In GAA we support reporting that's limited to biddable conversions and reporting across

**Commented [130]:** limiting to biddable conversions makes sense.

**Commented [131]:** To clarify, for web we have \_all web conversions\_ and \_all biddable web



25

Commented [132]: @chuyi [REDACTED]

Commented [133]: Conversion type. In fact, as I [REDACTED]

Commented [134]: btw, how does this work with EV [REDACTED]

Commented [135]: In GAA reporting, we use the ter [REDACTED]

Commented [136]: Current CDA path report only [REDACTED]

Commented [137]: We allow configurable windows f [REDACTED]

Commented [138]: @pensadov [REDACTED]

Commented [139]: What would it involve to add [REDACTED]

Commented [140]: I checked with Guoling about EV [REDACTED]

Commented [141]: >> Currently for web, we do not [REDACTED]

Commented [142]: Just to clarify, the PMT design d [REDACTED]

Commented [143]: >> Adding a 3-day fixed window [REDACTED]

Commented [144]: Aggregation table contains the [REDACTED]

Commented [145]: Would you mind updating / loopi [REDACTED]

Commented [146]: I think default makes more sense [REDACTED]

Commented [147]: Thanks for confirming, and make [REDACTED]

Commented [148]: We might need a meeting to [REDACTED]

Commented [149]: Hmm, we won't run DDA on AC\* [REDACTED]

Commented [150]: FYI, @rayluong [REDACTED]

Commented [151]: @shuangsi [REDACTED]

Commented [152]: Network type (channel) include [REDACTED]

Commented [153]: By the way, by the time we're [REDACTED]

Commented [154]: Charles, in GAA we don't have th [REDACTED]

Commented [155]: It doesn't look like Apps is one of [REDACTED]

Commented [156]: It looks like the app vs. web does [REDACTED]

Commented [157]: For #1, simply extending the [REDACTED]

Commented [158]: For #1, if we only list conversion [REDACTED]

Commented [159]: Gotcha, yes, I've added this to th [REDACTED]

Commented [160]: I believe that campaign types are [REDACTED]

Commented [161]: The campaign\_type column in th [REDACTED]

Commented [162]: For #2. Device and stream shoul [REDACTED]

Commented [163]: Update here: campaign\_type [REDACTED]

Commented [164]: @chuyi [REDACTED] Am I corre [REDACTED]

Commented [165]: I guess (c) and (d) convey that a [REDACTED]

Commented [166]: Thanks, so I think no additional l [REDACTED]

Commented [167]: Right, yeah, modulo any edges [REDACTED]

Commented [168]: @chuyi [REDACTED] Could you [REDACTED]

Commented [169]: This is just meant to convey that [REDACTED]

Commented [170]: Sounds good!

Commented [171]: Thanks both. It sounds like the [REDACTED]

Commented [172]: Agree, than [REDACTED]

Commented [173]: @kechyeke [REDACTED] and [REDACTED]

Commented [174]: I think we need to align with [REDACTED]

## Key questions

See active discussions [Apps in GAA](#) and [DDA for Apps Open Actions](#).

**Commented [175]:** Is this answered? My understanding is 3ps will still play a big role as source of truth for app advertisers.

**Commented [176]:** Yeah, that's the current thinking. I added a second sub-bullet to capture this.

**Commented [177]:** Is this "app attribution data" or just "app conversion data"?

**Commented [178]:** Is this referring to Ads preferred DDA or X-channel DDA?  
@chuy [REDACTED]  
Assigned to Charles Huyi\_

**Commented [179]:** Could you help me understand what each one is? Are x-channel DDA credits what Analytics produces and Ads preferred DDA what Google Ads produces using raw, unattributed conversions data from Analytics? This is closely related to  
[https://docs.google.com/document/d/1JLZDbKYOLSIzG\\_JEk3J7v3BZ-ZISpTBEVqdbZQX\\_P/edit?ts=5f1321c5](https://docs.google.com/document/d/1JLZDbKYOLSIzG_JEk3J7v3BZ-ZISpTBEVqdbZQX_P/edit?ts=5f1321c5).

**Commented [180]:** Do we plan to add app conversion attribution report to the existing GAA report?

**Commented [181]:** Thanks for kicking off the discussion.  
Added a few questions / points of confirmation here to see if we're all aligned in our initial understanding of things.  
[https://docs.google.com/document/d/1JLZDbKYOLSIzG\\_JEk3J7v3BZ-ZISpTBEVqdbZQX\\_P/edit?ts=5f29f47b#bookmark=id.f522o7p9ueks](https://docs.google.com/document/d/1JLZDbKYOLSIzG_JEk3J7v3BZ-ZISpTBEVqdbZQX_P/edit?ts=5f29f47b#bookmark=id.f522o7p9ueks).

**Commented [182]:** Given the decisions in <https://docs.google.com/presentation/d/1aepAc3fnP9qwrpuFssb4GOybel7gndPmnjUKWjKPQs/edit#slide=id.g1aepAc3fnP9qwrpuFssb4GOybel7gndPmnjUKWjKPQs>

**Commented [183]:** +1

**Commented [184]:** Thanks Hetal. With perf and okrs coming soon. It would help to schedule this sooner rather than later.

**Commented [185]:** Hetal, feel free to set up, or if you share a list of attendees, I'm happy to do it too.

**Commented [186]:** Scheduled for Friday tentatively. Please feel free to modify as needed. Thanks

**Commented [187]:** For me to understand the background, is it possible for the app owner to use the same account and different campaigns to measure

**Commented [188]:** >> is it possible for the app owner to use the same account and different campaigns to measure different conversion objectives (e.g. install v

**Commented [189]:** The issue further complicates when each account have different conversion types: if one account has DDA and other account says do last





#### Implementation

##### Aggregation

Owner:

- A
- B
- C

##### - QE

Owner:

- A
- B
- C

##### GAA - Processing (Ingestion)

Owner:

- Note: There may not be any changes needed to the GAA system since we are proposing to do both the GA and GAA path on instance of (i.e., Ads-preferred DDA and x-

Commented [190]: @pensado, could you update this placeholder to reflect the point / question you raised during today's meeting? Thanks!

@hetal, FYI.  
Assigned to Armando Pensado

Commented [191]: This part just wasn't clear to me since I'm not familiar with apps, it sounds like apps

Commented [192]: Ah, not just, apps can also attribute to Search campaigns, app campaigns, etc.

Commented [193]: Sorry I still don't quite get it. Maybe I'm mixing up what it means to attribute to an app

Commented [194]: Adding a Network != "YouTube" filter in path reports / Model comparison could filter

Commented [195]: I don't want to butcher your doc, so sounds like there's two things to watch out for:

Commented [196]: Butcher away, heh, no worries. I've captured your two points at the end of th

Commented [197]: ok, I simplified to what was my point, feel free to add back your words if you feel that

Commented [198]: Thanks!

Commented [199]: @msiska are there any special considerations we should keep in mind

Commented [200]: Do we plan to add more dimensions in the reports? e.g. app vs web?

Commented [201]: @kellynelson and @cteng what do you think - are there

Commented [202]: @cole to help

Commented [203]: I'd think web vs. app conversions for sure. If by conversion type you mean segments lik

Commented [204]: >> I'd think web vs. app conversions for sure.

Commented [205]: +1 to app vs web and exposing conversion type (EVC vs Click) - would love to align

Commented [206]: Hmm, could you explain EVC vs. Click further?

Commented [207]: we recently started exposing "ad interaction type" so customers can see which

Commented [208]: Thanks for sharing the pointer! Logged this in the Reporting in Google Ads section

Commented [209]: yes - I believe something like that would be entirely adequate for apps customers

Commented [210]: @lanhuang what are the key teams we should list here?

Commented [211]: Charles, I would imagine we can start with a similar group of teams like GDA for GAA.

Commented [212]: Sure, added placeholders. We can consolidate if needed. Would you want to start



channel DDA attribution will be done on a single stack unlike web where we have GAA as a separate stack / system.)

GAA - Processing (Attributor)

Owner: [REDACTED]

- A
- B
- C

GAA - Modeling

Owner: [REDACTED]

- A
- B
- C

GAA - Processing (Ingestion)

Owner: [REDACTED]

- A
- B
- C

GAA - PMT

Owner: [REDACTED]

- A
- B
- C

GAA - Export (AWCT reporting and bidding)

Owner: [REDACTED]

- A
- B
- C

GAA - Aggregation

Owner: [REDACTED]

- A
- B
- C

GAA - Serving

Owner: [REDACTED]

- A
- B
- C

GAA - UI

Owner: [REDACTED]

- A
- B
- C

GAA - AP / Evenflow

Owner: [REDACTED]

- A
- B
- C

GAA - Bidding

Owner: [REDACTED]

- A
- B
- C

**Timelines**

- Oct 15: Google Analytics will provide path data to the [REDACTED] team.

# Appendix A-15

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA

ANIBAL RODRIGUEZ, JULIEANNA )  
MUNIZ, ELIZA CAMBAY, SAL ) Case No.:  
CATALDO, EMIR GOENAGA, JULIAN ) 3:20-cv-04688  
SANTIAGO, HAROLD NYANJOM, KELLIE )  
NYANJOM, and SUSAN LYNN HARVEY, )  
individually and on behalf of all )  
others similarly situated, )  
Plaintiffs, )  
vs. )  
GOOGLE LLC, )  
Defendant. )

-----)

\*\*\*HIGHLY CONFIDENTIAL - ATTORNEYS EYES ONLY\*\*\*

REMOTE PROCEEDINGS OF THE  
VIDEOTAPED DEPOSITION OF STEVE GANEM  
FRIDAY, OCTOBER 28, 2022

REPORTED BY NANCY J. MARTIN  
CSR. NO. 9504, RMR, RPR  
CLAUDIA R. GARCIA, CSR. 12812  
JOB No. 5554575

PAGES 1-325

Page 1

1 MR. SANTACANA: Compound.

2 THE WITNESS: The Google Analytics customer  
3 needs to create a Google Analytics account, agree to  
4 the terms of service, including disclosure policies  
5 and consent policies. They would need to integrate  
6 the Google Analytics for Firebase SDK. They would  
7 need to enable the Google signals setting, which,  
8 again, by default is turned off for all customers.

9 The end users who use their apps would need  
10 to be signed in on their device. They would have to  
11 turn on ads personalization, turn on app and web  
12 activity, turn on what we would refer to as SWAA which  
13 is -- which allows for the web and app activity in  
14 third-party sites that integrate Google services to be  
15 associated with their accounts.

16 And only in those circumstances would it be  
17 possible for their GAIA identity to be joined in and  
18 written to separate logs, not the same logs as they're  
19 pseudonymous log activity.

20 BY MR. MAO:

21 Q. So this first log said that you called app  
22 measurement, these are [REDACTED]?

23 (Pause.)

24 BY MR. MAO:

25 Q. Sir?

1           A. I can answer in the context of Google  
2     Analytics.

3           Q. Yeah. Please, for Google Analytics.

4           A. In the context of Google Analytics, when  
5     events from a third-party SDK are transmitted to our  
6     servers, if that IDFA is not mappable, if it even is  
7     present subject to all the settings I mentioned, if  
8     that's not mappable to any GAIA, and since the  
9     settings you're referring to are GAIA-related account  
10    settings, there's no way to look up the SWAA settings,  
11    and there's no attempt to infer that in Google  
12    Analytics.

13          Q. So where on iOS -- after iOS 14 was released,  
14    there is no way to do that look up, what does Google  
15    Analytics for Firebase do with regard to data coming  
16    in for the [REDACTED]? Does it get associated with the  
17    GAIA side or the non GAIA side? Like what happened  
18    after iOS 14, I guess, is my question?

19          A. Data corresponding to user interactions in  
20    the app are transmitted and associated with  
21    [REDACTED] in the app measurement logs,  
22    as they've always been.

23                 What's different is that since there is  
24    practically no way to look up the corresponding GAIA  
25    and/or to check its SWAA settings, there's no writing

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C E R T I F I C A T E

I, the undersigned, a Certified Shorthand Reporter of the State of California, do hereby certify;


That the foregoing proceedings were taken before me stenographically at the time and place herein set forth; that any witnesses in the foregoing proceedings, prior to testifying, were administered an oath; that a record of the proceedings was made by me using machine shorthand which was thereafter transcribed under my direction; that the foregoing transcript is a true record of the testimony given.

Further, that if the foregoing pertains to the original transcript of a deposition in a Federal Case, before completion of the proceedings, review of the transcript [ ] was [ ] was not requested.

I further certify I am neither financially interested in the action nor a relative or employee or any attorney or any party to this action.

IN WITNESS WHEREOF, I have this date subscribed my name.

Dated: November 22, 2022

A handwritten signature in cursive script, reading "C. R. Garcia", is written over a horizontal line.

CLAUDIA R. GARCIA, CSR. 12812

# Appendix A-16



## Appendix X4 to Black Expert Rebuttal Report - Fingerprinting Policy Language.xlsx

Exhibit	Policy Title	Effective Date/Last Reviewed	Language in Policy
1		January 21, 2015	Device, app, or browser fingerprinting or immutable identifiers must not be used in any Google products or services for the purposes of: <ul style="list-style-type: none"> <li>• Tracking user behavior, including: <ul style="list-style-type: none"> <li>o Ad measurement and prediction</li> <li>o Ad targeting</li> </ul> </li> <li>• Recording preferences</li> </ul> <p>It is recommended that immutable IDs under Google's control (e.g., returned by Chrome or Android APIs) have minimal scope (e.g., per recipient). They should be statistically independent between scopes (i.e., it is not possible to infer recipient A's ID from recipient B's). Example: for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).</p>
2	Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy)	January 21, 2015	Device, app, or browser fingerprinting or immutable identifiers must not be used in any Google products or services for the purposes of: <ul style="list-style-type: none"> <li>• Tracking user behavior, including: <ul style="list-style-type: none"> <li>o Ad measurement and prediction</li> <li>o Ad targeting</li> </ul> </li> <li>• Recording preferences</li> </ul> <p>It is recommended that immutable IDs under Google's control (e.g., returned by Chrome or Android APIs) have minimal scope (e.g., per recipient). They should be statistically independent between scopes (i.e., it is not possible to infer recipient A's ID from recipient B's). Example: for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).</p>
3	Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy)	February 24, 2016	Device, app, or browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: <ul style="list-style-type: none"> <li>• Tracking user behavior, including: <ul style="list-style-type: none"> <li>o Ad measurement and prediction</li> <li>o Ad targeting</li> </ul> </li> <li>• Recording preferences</li> </ul> <p>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs should be per recipient. Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).</p>
4	Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy)	February 24, 2016	Device, app, or browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: <ul style="list-style-type: none"> <li>• Tracking user behavior, including: <ul style="list-style-type: none"> <li>o Ad measurement and prediction</li> <li>o Ad targeting</li> </ul> </li> <li>• Recording preferences</li> </ul> <p>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs should be per recipient. Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).</p>
5	Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy)	May 12, 2017	Device, app, or browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: <ul style="list-style-type: none"> <li>• Tracking user behavior, including: <ul style="list-style-type: none"> <li>o Ad measurement and prediction</li> <li>o Ad targeting</li> </ul> </li> <li>• Recording preferences</li> </ul> <p>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs should be per recipient. Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).</p>
6	Device Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy)	October 12, 2017	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: <ul style="list-style-type: none"> <li>• Tracking user behavior, including: <ul style="list-style-type: none"> <li>o Ad measurement and prediction</li> <li>o Ad targeting</li> </ul> </li> <li>• Recording preferences</li> </ul> <p>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).</p>
	Device/App/Browser Fingerprinting and Immutable Identifiers Policy (go/fingerprintingpolicy)		Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of: <ul style="list-style-type: none"> <li>• Tracking user behavior, including: <ul style="list-style-type: none"> <li>o Ad measurement and prediction</li> <li>o Ad targeting</li> </ul> </li> <li>• Recording preferences</li> </ul> <p>Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).</p>

## Appendix X4 to Black Expert Rebuttal Report - Fingerprinting Policy Language.xlsx

7		Device/app/browser fingerprinting or immutable identifiers **must not** be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	October 12, 2017
8	Device/App/Browser Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	May 30, 2018
9	Device/App/Browser Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	August 27, 2019
10	Device/App/Browser Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	September 03, 2019
11	Device/App/Browser Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	January 9, 2020
12	Device/App/Browser Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	January 9, 2020
13	Device/App/Browser Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	January 9, 2020
14	Device/App/Browser Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	January 9, 2020
15	Device/App/Browser Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	May 19, 2021
16	Digital Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	May 19, 2021
17	Digital Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	May 19, 2021
18	Digital Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	May 31, 2021
19	Digital Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	May 31, 2021
20	Digital Fingerprinting and Immutable Identifiers Policy	Device/app/browser fingerprinting or immutable identifiers must not be used by any Google products or services for the purposes of:  Tracking user behavior, including: Ad measurement and prediction Ad targeting Recording preferences  Immutable IDs under Google's control should have minimal scope. For example, IDs returned by Chrome and Android APIs have minimal scope (e.g., per recipient). Immutable IDs should also be statistically independent between scopes; it should not be possible to infer recipient A's ID from recipient B's. For example, for DRM authentication, our API should return a different identifier for each recipient (e.g., Netflix, Vudu).	November 25, 2019
21	Google Analytics and Google Analytics for Firebase on Alphabet Properties Policy IMD user data and consents	An Alphabet property must not collect PI or identifiers that can be joined to PI in Google Analytics. If PI is accidentally tracked by Google Analytics, you must report the details to PI injection reporting form so this data can be scrubbed out of GA's data repository. (This process is managed by analytics-data-deletion-requests@, not by pvg-analytics@). An Alphabet property must not send either explicit location or indirect user position information (except as included in default analytics collection) into an Analytics property. An Alphabet property must ensure Google Analytics cookies are not logged by the product (separately from Google Analytics). Do not collect cid (or application instance id) to non-GA storage such as Sawmill and/or Clearcut.  Personal App content... (data doesn't leave the device, and isn't GAIA-keyed)	March 28, 2018

## Appendix X4 to Black Expert Rebuttal Report - Fingerprinting Policy Language.xlsx

22		November 9, 2020	<p>Google purges the original, un-redacted IP addresses from all datastores (including backups) within 9 months of collection. . . In Sawmill, we start scrubbing nearly 3 months before the deadline.</p> <p>We remove certain other information at the same time as IP addresses. Usually these redactions were requested by the product teams or privacy team at the time the field was added to Sawmill. We also apply TTL scrubbing during this pass, for non-personal logs.</p> <p>Within 18 months of collecting pseudonymous logs, we redact cookies and any other stable identifiers within the log to lower its reidentification risk. In particular, we try to break links that would tie records together over long periods of time, because building months-long sessions of user activity makes it more likely that the data can be reidentified.</p> <p>Access to and use of User Data may be monitored, and violations of this policy and other privacy policies may result in disciplinary action, including termination of employment. Googlers and TVCs observing violations of these policies should report them at <a href="https://www.google.com/go/incidentresponse">go/incidentresponse</a></p> <p>• Authorization to access Personally Identifiable User Data may require user consent. In addition to approval by the Data Owner, Personally Identifiable User Data access may require verifiable user consent in a manner approved by Google Product Counsel. See User Data Access Authorization Guidelines for more information.</p> <p>• Authorization is granted only for a specific purpose. Authorized access to User Data for one purpose does not mean it can be used for another purpose. Do not access User Data for anything other than the original authorized purpose without seeking additional authorization from the Privacy Working Group or appropriate User Data Delegate.</p> <p>• Googlers should use Anonymous Data or Pseudonymous User Data whenever possible. Processing Anonymous or Pseudonymous User Data presents fewer risks to users than PII, and access to anonymized data may be granted in lieu of more sensitive access permissions depending on the business purpose.</p> <p>• Keep User Data only on approved systems. User Data should be stored securely at all times on systems approved by the Privacy Working Group or User Data Delegate, and in formats that are appropriate to the sensitivity of the data according to the Data Security Policy.</p> <p>• Only keep User Data as long as needed for the approved purposes. When User Data is no longer needed, User Data should be securely destroyed. For example, refer to User Data Retention and Deletion Policy and Data Destruction Guidelines for deletion and purging guidelines.</p>
23	Scrubbing policies for Log Data	June 24, 2019	
	User Data Access Policy		

# Appendix A-17

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA  
SAN FRANCISCO

--oOo--

ANIBAL RODRIGUEZ, et al.,  
individually and on behalf of  
all other similarly situated,  
Plaintiffs,

vs.

Case No.

3:20-CV-04688

GOOGLE LLC, et al.,  
Defendants.

-----/

VIDEO-RECORDED DEPOSITION OF SAL CATALDO  
VERITEXT VIRTUAL  
THURSDAY, FEBRUARY 17, 2022

Reported by:

Anrae Wimberley, CSR No. 7778

Job No. 5057262

1 to personalize ads on websites" -- 01:30:28

2 (Reporter seeks clarification.)

3 A. I apologize, I was saying it more so so  
4 that he and I would know that we're looking at the  
5 same thing, but -- 01:30:51

6 MR. LEE: She still has to write it down, so --

7 THE WITNESS: Yeah, no, I get it.

8 So when I click on the advanced carrot,  
9 this paragraph comes up, "Also use your activity and  
10 information from Google services to personalize ads 01:31:09  
11 on websites and apps that partner with Google to  
12 show ads."

13 Next sentence, "This stores data from  
14 websites and apps that partner with Google in your  
15 Google account." 01:31:30

16 So -- and that box is checked off. So  
17 right now, it is not checked, it's blank.

18 And so if I go to these settings and I  
19 see -- so going back to your question, Eduardo, to  
20 say that the ad settings are where the privacy 01:32:03  
21 policy would control that and why is it still on, I  
22 would say the ad settings are allowing the  
23 information I've shared to Google to potentially be  
24 used to personalize my ads saying, Do you want us to  
25 use information that we have to personalize your 01:32:25

Page 152

1 ads? 01:32:27

2 To me, the WAA setting says can Google  
3 have certain information. So my expectation is, if  
4 I've told Google don't take certain information  
5 using the WAA setting, I don't have to have the ad 01:32:44  
6 setting also off. The ad setting doesn't override  
7 and now allow Google to collect information that I  
8 didn't allow it to collect in the first place.

9 If I read that ad setting, it's saying, Do  
10 you want us to personalize your ads, yes or no? Not 01:33:01  
11 do you want us to go take information to increase  
12 your ads?

13 WAA tells me whether or not you can take  
14 and collect information, and if I've said, "No,"  
15 then it shouldn't matter what I do with my ads later 01:33:12  
16 on because I've already told you not to take my  
17 data. So you shouldn't have data with which to  
18 personalize my ads.

19 BY MR. SANTACANA:

20 Q. That's very helpful, and just a reminder 01:33:21  
21 to speak slowly even when you're thinking quickly.  
22 But yes, that's very helpful, and I understand your  
23 answer.

24 Let's continue through the privacy policy  
25 for a moment. 01:33:34

1 I, the undersigned, a Certified Shorthand  
2 Reporter of the State of California, do hereby  
3 certify:

4 That the foregoing proceedings were taken  
5 before me at the time and place herein set forth;  
6 that any witnesses in the foregoing proceedings,  
7 prior to testifying, were administered an oath; that  
8 a record of the proceedings was made by me using  
9 machine shorthand which was thereafter transcribed  
10 under my direction; that the foregoing transcript is  
11 a true record of the testimony given.

12 Further, that if the foregoing pertains to  
13 the original transcript of a deposition in a Federal  
14 Case, before completion of the proceedings, review  
15 of the transcript ( ) was (X) was not requested.

16 I further certify that I am neither  
17 financially interested in the action nor a relative  
18 or employee of any attorney of any party to this  
19 action.

20 IN WITNESS WHEREOF, I have this date  
21 subscribed my name.

22 Dated: February 28, 2022

23

24



25

ANRAE WIMBERLEY, CSR No. 7778

Page 213



# Appendix A-18

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA

ANIBAL RODRIGUEZ, et al.,

Plaintiffs,

v.

Case No.

GOOGLE LLC,

20-cv-04688-RS

Defendant.

\*\*\*\*\*

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

ZOOM VIDEOTAPED DEPOSITION OF

BELINDA LANGNER

Thursday, December 15, 2022

9:09 a.m. PST

REPORTED BY:

BELLE VIVIENNE, RPR, CRR, NJ-CRR,

WA/CO/NM-CCR

NATIONALLY CERTIFIED REALTIME

COURT REPORTER

JOB No. 5628019

PAGES 1 - 290

Page 1

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

1 MR. SANTACANA: Vague. 11:21:10

2 A. Mr. Mao, specifically I said 11:21:15

3 when sWAA is off, the Google Ads systems 11:21:17

4 do not use the data from Firebase 11:21:22

5 associated with that device in the 11:21:27

6 pseudonymous space for ads 11:21:30

7 personalization. 11:21:32

8 BY MR. MAO: 11:21:33

9 Q. Okay. But does Google serve ads 11:21:34

10 nonetheless where WAA or sWAA is off still 11:21:38

11 using the ADID or the IDFA, if they're 11:21:42

12 available? 11:21:46

13 MR. SANTACANA: Vague. 11:21:47

14 BY MR. MAO: 11:21:47

15 Q. Let me perhaps help, 11:22:17

16 Ms. Langner. I'm definitely not trying to 11:22:19

17 trick you with this. If you don't mind, 11:22:21

18 I've actually introduced Exhibit Number 2. 11:22:23

19 A. Sure. 11:22:25

20 Q. Maybe this will help a little 11:22:26

21 bit. 11:22:27

22 MR. MAO: And for Exhibit 11:22:28

23 Number 2, Mr. Santacana, I'm only 11:22:31

24 asking regarding Interrogatory 11:22:32

25 Number 1, okay? 11:22:35

Page 78

HIGHLY CONFIDENTIAL - ATTORNEYS' EYES ONLY

CERTIFICATION

I, BELLE VIVIENNE, a Nationally  
Certified Realtime Reporter, do hereby  
certify:

That the witness whose testimony as  
herein set forth, was duly sworn by me;  
and that the within transcript is a true  
record of the testimony given by said  
witness.

I further certify that I am not  
related to any of the parties to this  
action by blood or marriage, and that I am  
in no way interested in the outcome of  
this matter.

IN WITNESS WHEREOF, I have hereunto  
set my hand this 19th day of December  
2022.



BELLE VIVIENNE, CRR, CCR, RPR

# Appendix A-19

UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA

ANIBAL RODRIGUEZ, et al.,

Plaintiffs,

vs.

Case No. 3:20-cv-04688-RS

GOOGLE LLC,

Defendant.

---

DEPOSITION OF MICHAEL J. LASINSKI, taken  
on behalf of the Defendant, at Willkie Farr &  
Gallagher, LLP, One Front Street, 34th Floor,  
San Francisco, California, commencing at  
10:19 a.m., Thursday, June 29, 2023 before  
REBECCA L. ROMANO, a Certified Shorthand Reporter,  
Certified Court Reporter, Registered Professional  
Reporter.

## ATTORNEYS EYES ONLY

1 result of what the value of nonpersonal -- 12:20:04  
2 personalized ads would be versus the value of  
3 personalized ads, or the revenue generated from  
4 personalized ads versus nonpersonalized ads.

5 Q. So my question was whether you reached a 12:20:28  
6 conclusion as to how GAP and SWAA differ with  
7 respect to their impact on personalization of ads.

8 And you answered as to your understanding  
9 of GAP, I think. Feel free to elaborate though.

10 But can you now address SWAA? 12:20:46

11 MR. LEE: Objection. Vague.

12 Answer if you can.

13 THE DEPONENT: I thought that I had  
14 answered that.

15 But the second half of my answer is, my 12:20:55  
16 understanding is that SWAA -- my understanding is  
17 that Google has represented that SWAA-off users do  
18 not receive personalized ads.

19 And so in calculating my unjust  
20 enrichment, I looked at -- what I was looking for 12:21:18  
21 there was the relationship between personalized and  
22 unpersonalized ads. And that's -- and so I use the  
23 GAP tracker -- the GAP -- the GAP's relationship  
24 between personalized and unpersonalized ads from a  
25 revenue standpoint for my calculations. 12:21:44

Page 79

## ATTORNEYS EYES ONLY

1 In -- you said that was for Scenario 2. 12:23:33

2 For Scenario 1, did you assume that  
3 sWAA-off users received personalized ads from  
4 sWAA-off data?

5 A. No. 12:23:49

6 Q. So for neither scenario did you assume  
7 that sWAA-off users were receiving personalized ads  
8 that relied on sWAA-off data?

9 A. Correct.

10 Q. Then why did you measure the value of 12:24:04  
11 personalization for purposes of your unjust  
12 enrichment opinion?

13 A. I measured the -- to be -- to be clear, I  
14 measured the value of -- I measured the relative  
15 value of personalization. 12:24:20

16 And the reason that I did that was  
17 because when I calculated my Scenario 2 damages, I  
18 needed to deduct nonpersonalized ads from two of my  
19 revenue bases, revenue bases after considering  
20 traffic acquisition costs and other -- and other 12:24:51  
21 apportionments. And the best data point available  
22 is in this impact -- is in this [REDACTED]

23 [REDACTED]  
24 And so I was making a downward adjustment  
25 in my model to ensure that I only deducted revenue 12:25:08

Page 81





## ATTORNEYS EYES ONLY

1 looking at the actual unjust enrichment in that -- 02:33:32  
2 in that case.

3 I'm actually looking at what they  
4 actually earned, what was actually paid to them in  
5 that case. 02:33:43

6 Q. Right.

7 A. And they -- in the but-for world, they  
8 would not have been able to serve those ads.

9 They did serve those ads, so that's what  
10 they actually earned. That's my -- that's the 02:33:56  
11 calculation that I'm making.

12 Q. So, then, is it fair to say that you are  
13 not trying to hypothesize how consumer and  
14 advertiser and Google behavior would have changed  
15 in the but-for world? Your task really was to 02:34:13  
16 measure the exact amount of profits Google did make  
17 from SWAA-off advertising?

18 A. Yes. So in the but-for world, Google  
19 actually served those ads and actually profited  
20 from the information that it collected. And 02:34:35  
21 that's --

22 Q. In the real world?

23 A. In the real world, they did.

24 In the but-for world, they should have  
25 not been able to. 02:34:43

Page 129

ATTORNEYS EYES ONLY

1 they've switched an ad blocker on. 02:42:37

2 I've assumed -- I've assumed that their  
3 data is not available for Google to serve an ad in  
4 Scenario 2.

5 Q. So it's not an ad blocker; it's a Google 02:42:49  
6 ad blocker?

7 MR. LEE: Objection to form.

8 THE DEPONENT: My understanding is, based  
9 on input given to me, is that Google would not be  
10 able to serve an ad in those situations. 02:43:06

11 Whether or not you want to call it an ad  
12 blocker, I've never called it that, but Google  
13 would not be able to serve an ad in those  
14 situations.

15 Q. (By Mr. Santacana) Okay. 02:43:19

16 Take a look at paragraph 87 of your  
17 report.

18 A. Okay.

19 Q. And then 88, please.

20 A. Okay. 02:45:17

21 Q. In 87 and 88, you identify a figure,  
22 82.2 percent, as equivalent to Google's  
23 determination of the proportion of App Display  
24 revenue from signed-in users as represented in the

25 [REDACTED] 02:45:37

# Appendix A-20

CONFIDENTIAL - ATTORNEYS' EYES ONLY

\*\* C O N F I D E N T I A L \*\*

\*\* ATTORNEYS' EYES ONLY \*\*

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN FRANCISCO DIVISION

Case No. 3:20-cv-04688-RS

-----X

ANIBAL RODRIGUEZ, et al. individually

and on behalf of all others similarly situated,

Plaintiff,

- against -

GOOGLE LLC,

Defendant.

-----X

June 26, 2023

10:05 a.m.

Videotaped Deposition of JONATHAN HOCHMAN, taken by Defendant, pursuant to Notice, held at the offices of Willkie Farr & Gallagher LLP, 787 Seventh Avenue, New York, New York, before Todd DeSimone, a Registered Professional Reporter and Notary Public of the State of New York.

Page 1

CONFIDENTIAL - ATTORNEYS' EYES ONLY

1 look at the table of contents, because I  
2 don't know myself. Okay, oops, this table  
3 of contents -- let me go into -- let me  
4 check in one other location here.

5 Q. I think you mean Appendix G,  
6 tab 4, but I could be wrong.

7 A. Yeah, let's take a look at  
8 that.

9 Q. It is pretty long, so maybe  
10 I'll break down the question for a moment.

11 A. Sure.

12 Q. My first question is just did  
13 you attempt in this case to join -- strike  
14 that. Let me try again.

15 Did you attempt in this case to  
16 find evidence that Google had joined in the  
17 same log device ID and GAIA ID? Was that  
18 one of the things you did?

19 A. I think that had we noticed  
20 that, had I noticed that, I would have  
21 documented it.

22 Q. Okay.

23 A. So I --

24 Q. I don't think you did.

25 A. Yeah, I don't think I

Page 135

CONFIDENTIAL - ATTORNEYS' EYES ONLY

1 necessarily found an indication of joining.

2 So just to be clear, joining  
3 and linking are two different things.

4 Joining means putting the two pieces  
5 together in the same place. Linking means  
6 that there is just a logical connection  
7 between the two pieces of data, okay?

8 There is a common identifier or there is a  
9 common fingerprint, okay? There might  
10 be -- data might be stored in separate  
11 places but there is a common -- there is a  
12 link between them.

13 Q. Got it.

14 A. Okay? So I'm using the  
15 standard of linking, not of joining.

16 Q. I understand. So I hadn't  
17 heard that distinction before, but join we  
18 will use to mean actually joined together  
19 in the same place, whereas linking is about  
20 the availability of a mapping that may or  
21 may not have been used to join. Is that  
22 fair to say?

23 A. We don't know whether -- we  
24 don't know whether someone has joined it or  
25 not, we just know that it is linked, there

Page 136

CONFIDENTIAL - ATTORNEYS' EYES ONLY

1 A. Yes.

2 Q. And then in your definition of  
3 personalization, when you say "information  
4 associated with their user ID," there I  
5 think you are referring to, and I can pull  
6 up the document, but I think you are  
7 referring to information that is in what  
8 you called earlier a dossier about the  
9 user, right?

10 A. Yes, and in this case it would  
11 be the dossier of data collected in what  
12 Google calls the user's account, in other  
13 words, the area that's associated -- the  
14 data structure that's associated with a  
15 GAIA ID, or the data stored that is  
16 associated with the GAIA ID.

17 Q. Got it, okay. So with that  
18 clarification in mind, you're not -- you're  
19 not disputing in this case that Google will  
20 not personalize ads, as we have just  
21 defined it in this back and forth, with  
22 sWAA-off Google analytics for Firebase  
23 data?

24 A. That's correct. I only said  
25 that Google, just because they are not

Page 194



CONFIDENTIAL - ATTORNEYS' EYES ONLY

1 into being contextual, but maybe there is  
2 something else that we haven't thought of.

3 Q. Okay. But as far as you know,  
4 you're familiar that Google uses the term  
5 "contextual targeting" in their  
6 developer-facing pages?

7 A. Yeah, I'm aware of contextual  
8 targeting from the ad platform side and  
9 often that was referring to like based on  
10 what words are in a content page on the  
11 display network and what words the user --  
12 the advertiser has specified in an ad  
13 campaign, and they might say oh, okay, you  
14 want to target people searching for white  
15 sneakers and here is an article about white  
16 sneakers, even though it is not a search,  
17 it is just a context page, maybe we will  
18 show your ad here because we think it is  
19 especially relevant in this context.

20 Q. Right.

21 A. So that is kind of maybe a  
22 little bit more specific than showing an ad  
23 based on someone's language or their  
24 general course location.

25 Q. Right. And from an internet

Page 204

CONFIDENTIAL - ATTORNEYS' EYES ONLY

1 marketing standpoint, in order to  
2 effectuate contextual targeting in a  
3 responsible way, Google has to say  
4 something about its serving of ads, some  
5 type of information?

6 A. I would even go further than  
7 that. I would say that in order to serve  
8 ads, Google needs to retain some data in  
9 order to comply with industry standards. I  
10 think Google is a member of the Media  
11 Rating Council and they are certified for  
12 generalized and valid traffic detection and  
13 sophisticated and valid traffic detection,  
14 and that's ad fraud detection.

15 Q. Okay.

16 A. So when you want to charge  
17 someone for ads, you actually have to  
18 retain some data in order to prove good  
19 delivery of the ads. You can't just say  
20 hey, I have shown your ad a million times,  
21 give me the money. You actually have to  
22 have some proof from a vendor who is MRC --  
23 ideally MRC certified who can provide some  
24 reliable statistics.

25 This MRC was set up in the

Page 205

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1 1960s by the Congress because there at the  
2 time had been a lot of lying about  
3 advertising on like television, radio,  
4 newspapers, like lying about the reach of  
5 the advertising. So Congress sort of  
6 decided to put an end to that and said  
7 let's certify the distribution of these  
8 ads. So that has moved into the online  
9 era, and Google and Google Analytics are a  
10 couple of the certified vendors.

11 Q. Okay.

12 A. That is more than what you  
13 wanted to know about that, but it might be  
14 helpful.

15 Q. In the context of this case,  
16 when we are talking about -- what's the  
17 term you would use, bookkeeping,  
18 recordkeeping, Ratings Council compliance?

19 A. I would just say you want to  
20 retain evidence of good delivery. Because  
21 one of the things as an advertiser that I  
22 like Google for is that they try to  
23 maintain a clean network. They try to  
24 protect me as an advertiser from ad fraud.  
25 They tell us that they conduct proactive

Page 206

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1 investigations. They have automatic  
2 systems that detect fraudulent activity and  
3 try to protect the advertiser from that.

4 Q. Isn't one of the ways they  
5 effectuate that by analyzing device ID and  
6 IP address?

7 A. Look, I can help you a little  
8 bit there. I've done a bunch of ad fraud  
9 cases, and one of the things to do is to  
10 look at the device ID and some of this  
11 collected data. So it is a known method  
12 for detecting ad fraud.

13 Q. Would Google have to drop that  
14 detection method for sWAA-off users to  
15 resolve the problems you've identified in  
16 your report?

17 A. I don't know. Would there be  
18 some way to work it out that these things  
19 could coexist? I'm not sure. Again, I  
20 would point back to my original  
21 observation, which is Google has put itself  
22 into a very difficult position by promising  
23 the user, hey, we are going to be your  
24 advocate for privacy and the vendors they  
25 work with. They've got some overlapping

Page 207

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1 and conflicting obligations, and that  
2 creates a problem for them and maybe they  
3 ought to focus on one business or the other  
4 in order to do the best possible job for  
5 each constituency.

6 Q. Okay. Well, but for now let's  
7 assume that they are not going to drop  
8 users or drop advertisers in the immediate  
9 future. The fraud detection mechanism that  
10 you were just talking about it sounds like  
11 relies on certain persistent or  
12 non-temporary, non-transient identifiers,  
13 right?

14 A. This ends up being a deep  
15 rabbit hole that we are going into here  
16 about like how would Google do this. I  
17 mean, maybe there is some way that they can  
18 work it out. You know, maybe they can talk  
19 to the advertisers and, you know, talk to  
20 the industry standards and say hey, you  
21 know, in order to respect privacy, we can't  
22 collect this data for certain segment of  
23 people who turn this off, but we know these  
24 are real people because they've got Google  
25 accounts. You know, you have to have a

Page 208

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1 Google account in order to have a WAA and  
2 sWAA set. So there is already some level  
3 of authentication there.

4 Like if Google authenticates  
5 these people that these are real people who  
6 have real Google accounts, you know, maybe  
7 that is a substitute for the telemetry,  
8 perhaps, I don't know. That's a really  
9 detailed thing that someone is going to  
10 have to work out afterwards.

11 Q. But if Google doesn't save  
12 anything from the transaction, then that  
13 would -- then it can't prove that it told  
14 the truth that it was a Google account and  
15 therefore a real person?

16 A. Again, I don't know. Like  
17 could they work out some better  
18 arrangement? They might be able to work  
19 out a better arrangement. But looking back  
20 retrospectively, you know, it was  
21 essentially if you didn't collect this  
22 data, you would have a lot of problems  
23 charging for those ads.

24 Q. And I think you say in your  
25 report that if sWAA functioned the way that

Page 209

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1 is a little bit jargony.

2 Q. Well, and because you didn't  
3 use it in your report.

4 A. Well, but I talked about -- I  
5 talked about it. I talked about the idea  
6 that the data that includes identifiers  
7 someone can extract an identifier from a  
8 phone and they can now match it to the  
9 data. So joinability is like taking two  
10 pieces of data and putting them together,  
11 whereas reidentification is you have some  
12 external source of knowledge and you  
13 combine it with a piece of data and now you  
14 have reidentified the data.

15 Q. Got it. Are you opining in the  
16 case that Google has engaged in  
17 reidentification of sWAA data?

18 A. No, I'm not saying that Google  
19 is doing this. I'm assuming that Google  
20 has the best intentions here, but that the  
21 problem is from threat actors or external  
22 pressure applied to Google. Some foreign  
23 government goes and puts pressure on Google  
24 to release some data or something else  
25 happens that causes that data to go out of

Page 364

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1 Google's control and somebody else is  
2 exploiting it, and of course, I mean, there  
3 is always insider risk, and maybe Google  
4 changed its policy, maybe Google is nice  
5 today but they become evil in the future.

6 Q. Okay. So on that subject, you  
7 said something about Google having  
8 separated them, "them" being I guess GAIA  
9 logs and non-GAIA logs, they can put them  
10 back together. Do you recall that?

11 A. Yes.

12 Q. And I think you said, for  
13 example, under some type of legal pressure.  
14 Do you recall that?

15 A. That's a possibility, sort of a  
16 risk as a security technologist that one  
17 would analyze and recognize.

18 Q. Just to be clear, you do not in  
19 this case render the opinion that Google  
20 has for any particular member of the class  
21 or named plaintiff put them back together  
22 under legal pressure or for any other  
23 reason?

24 A. No, I haven't given that  
25 opinion.

Page 365



# Appendix A-21

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**UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA**

<p>ANIBAL RODRIGUEZ, SAL CATALDO, JULIAN SANTIAGO, and SUSAN LYNN HARVEY, individually and on behalf of all other similarly situated,</p> <p>Plaintiffs,</p> <p>v.</p> <p>GOOGLE LLC,</p> <p>Defendant.</p>	<p>No. 3:20-cv-04688-RS</p>
---	-----------------------------

**REBUTTAL EXPERT REPORT OF JOHN R. BLACK, PH.D.**

**May 31, 2023**

*Highly Confidential – Attorneys’ Eyes Only*

evidence and Mr. Hochman’s own report that AdView is terminology Google uses to name a log that contains ad impression data.<sup>107</sup>

91. An ad click is what it sounds like: a record that a user clicked (or tapped) on an ad shown in a third party app or other advertising surface, such as a website. Here again, the ad click entries in the record include information about the device displaying the ad, the app displaying the ad, and the format of the ad.

92. From my review of the adEvents log entries Google produced, I do not see any information in the entries that could be considered “app activity” information, as none of it relates to the activity the user engages in within the third party app serving the ad. The recording of ad requests, impressions, and clicks alongside device information, timestamps, and other similar record information is all directed at making a record that a user was shown or interacted with an ad, so that the advertiser whose ad it is can know that. In this way, Google serves as a bookkeeper for the advertiser. I am not aware of any use Google makes of sWAA-off adEvent data other than to calculate conversions, as Mr. Hochman describes. And that calculation simply connects the advertiser’s interaction with the user at time 1 with another interaction with the same advertiser at time 2.

93. Next, Mr. Hochman opines that ad events data include identifiers. From my review of the entries Google produced and the related evidence, I agree that ad events data can include identifiers, and typically will include either a pseudonymous identifier such as ADID or IDFA (when sWAA is off) or a GAIA (when sWAA is confirmed on). These identifiers can

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<sup>107</sup> Hochman Report, ¶ 122 (Google Mobile Ads SDK sends data to “several types of ad events,” including “ad views, in which the user views an ad displayed in the app[.]”).

# Appendix A-22

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**UNITED STATES DISTRICT COURT**

**NORTHERN DISTRICT OF CALIFORNIA**

**SAN FRANCISCO**

ANIBAL RODRIGUEZ AND JULIE ANNA  
MUNIZ, individually and on behalf of all other  
similarly situated,

Plaintiff,

vs.

GOOGLE LLC, *et al.*,

Defendant.

Case No. 3:20-CV-04688

**DEFENDANT GOOGLE LLC’S SECOND  
SUPPLEMENTAL OBJECTIONS AND  
RESPONSES TO PLAINTIFFS’  
INTERROGATORIES, SET SIX**

Judge: Hon. Richard Seeborg

Courtroom: 3, 17th Floor

Action Filed: July 14, 2020

PROPOUNDING PARTY: PLAINTIFFS ANIBAL RODRIGUEZ AND JULIEANNA MUNIZ

RESPONDING PARTY: DEFENDANT GOOGLE LLC

SET NO.: SIX (SECOND SUPPLEMENTAL RESPONSES)

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Google further objects to this Interrogatory as overbroad, unduly burdensome, and compound because it seeks an identification of every “data source (including logs)” without a clear definition of what Plaintiffs consider to qualify as a “data source.”

Google further objects to this Interrogatory as overbroad, unduly burdensome, and abusive to the extent it seeks information regarding all uses of “WAA OFF DATA” without limitation to data sent to Google by third-party app developers after collection, if any, through GA for Firebase—i.e. concerning Plaintiff’s theory of wrongdoing in the Third Amended Complaint.

Google further objects to this Interrogatory to the extent that it seeks information protected by the attorney-client privilege and/or the attorney work product doctrine.

Subject to and without waiving the foregoing, Google responds as follows:

Google has provided exacting detail of its main logs associated with the transmission of app-interaction / measurement data to Google via Google Analytics for Firebase when a user has turned WAA to “off,” *inter alia*, in response to Plaintiffs’ Interrogatory No. 1. Google has also provided samples of those primary logs that store the transmitted data, and is investigating further potential data sources that may contain such data. Google states, however, that it is not practical or relevant to account for every single potential data source (including logs) that may contain such data because there are various downstream users of the pseudonymous data described in response to Plaintiffs’ Interrogatory No. 1. Nevertheless, the policies in place as described in response to Interrogatory No. 1, including the policies that forbid the re-association of pseudonymous data with personal identifiers, apply to all such downstream users of the data.

**INTERROGATORY NO. 15:**

Please DESCRIBE how GOOGLE currently uses and previously during the CLASS PERIOD has used WAA OFF DATA, including by explaining the extent to which and how GOOGLE currently uses and previously during the CLASS PERIOD used WAA OFF DATA to track or measure conversions and personalize advertisements.

**HIGHLY CONFIDENTIAL – ATTORNEYS’ EYES ONLY****RESPONSE TO INTERROGATORY NO. 15:**

Google objects to this Interrogatory as vague and ambiguous with respect to the phrases “track or measure conversions” and “personalize advertisements.” Google objects to this Interrogatory as vague and ambiguous as to several undefined terms and phrases susceptible to multiple meanings. For purposes of this response, Google construes “Google” to mean Google LLC and “WAA” to mean the account-level setting called Web & App Activity.

Google further objects to this Interrogatory as overbroad, unduly burdensome, and abusive to the extent it seeks information regarding all uses of “WAA OFF DATA” without limitation to data sent to Google by third-party app developers after collection, if any, through GA for Firebase—i.e. concerning Plaintiff’s theory of wrongdoing in the Third Amended Complaint. Google further objects to this Interrogatory as duplicative, including because Google has already responded to an interrogatory describing “what occurs when users . . . turn off (or previously paused) Web & App Activity.”

Google further objects to this Interrogatory to the extent that it seeks information protected by the attorney-client privilege and/or the attorney work product doctrine.

Subject to and without waiving the foregoing objections, Google responds as follows: Google hereby incorporates its response and supplemental responses to Plaintiffs’ Interrogatory No. 1 as if set forth here, and objects to this Interrogatory to the extent it is duplicative of Interrogatory No. 1. In addition to Google’s responses to Interrogatory No. 1, Google responds here that it uses data sent to it via Google Analytics for Firebase for each of the uses described in its Privacy Policy and Google Analytics for Firebase Terms of Service, according to the settings and consents provided by both end users and Firebase customers. This includes pseudonymous conversion tracking and ad targeting for anonymized ad profiles.

**SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 15**

Subject to and without waiving the foregoing, Google responds further as follows:

DeviceID-keyed advertising interactions with an advertiser, such as views and clicks of that advertiser’s ads, are joined to conversions recorded in that advertiser’s app using Firebase (or

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1 other third party conversion tracking products or services). In this way, Google serves as an  
2 accountant, helping advertisers understand when the same device that interacted with their ad  
3 subsequently converted (e.g., opened their app, or made an in-app purchase, depending on how the  
4 advertiser has defined a conversion for the ad campaign).

5 When a user is signed in and has sWAA off, app activity data sent to Google via GA4F  
6 while sWAA is off cannot be used for personalization. If a user is signed out on a device and also  
7 happens to have one or more Google accounts that have sWAA turned off at the time of app  
8 activity in a GA4F-enabled app on that device, that app activity data could become part of an  
9 anonymized ad profile for ads personalization.

**INTERROGATORY NO. 16:**

11 Please DESCRIBE all facts that support or undermine a defense or affirmative defense that  
12 YOU have asserted, intend to, will, or may assert in the present litigation.

**RESPONSE TO INTERROGATORY NO. 16:**

14 Google objects to this Interrogatory as compound and unduly burdensome. Google objects  
15 to this Interrogatory as vague and ambiguous with respect to the phrase “support or undermine a  
16 defense or affirmative defense.” Google further objects to this Interrogatory because it  
17 prematurely seeks expert opinion. Google further objects to this Interrogatory to the extent that it  
18 seeks information protected by the attorney-client privilege and/or the attorney work product  
19 doctrine.

20 Subject to and without waiving the foregoing objections, Google responds that it is willing  
21 to meet and confer with Plaintiffs over an appropriate response to this Interrogatory, including  
22 with respect to how to address its compound nature.

**SUPPLEMENTAL RESPONSE TO INTERROGATORY NO. 16:**

24 Subject to and without waiving the foregoing, Google responds further as follows:

25 App developers who use the GA for Firebase SDK must agree to Google Analytics Terms  
26 of Service, which requires that app developers disclose the use of Google Analytics and how it  
27 collects and processes data. See <https://firebase.google.com/terms/analytics>;



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1 <https://marketingplatform.google.com/about/analytics/terms/us/>. App developers who use GA for  
2 Firebase SDK have been expected to comply with the Google Analytics Terms of Service and/or  
3 the GA for Firebase Terms of Service, including disclosing to end users that they use Google’s  
4 analytics services, and that certain data is being collected by the app developer and transmitted to  
5 Google to store, process, and analyze.

6 Many app developers provide their end users with a way to opt out of analytics usage,  
7 and/or to delete data the developer has collected from that user’s device and sent to Google. *See*  
8 Ganem Rough Tr. at 139–41. Upon receipt of such data, before logging any of it, as detailed in  
9 response to Interrogatory No. 1, Google undertakes several consent checks if the developer has  
10 enabled Google Signals or Enhanced Firebase Audiences. Google uses a DSID token sent with  
11 the app measurement data to query the EventFE server at Google. If the user has a number of  
12 privacy controls enabled, including sWAA, and the app developer has Google Signals enabled,  
13 then the EventFE server will return a GAIA ID for that user, and GAIA-tied app measurement  
14 data will be written to an app measurement-gaia log. If EventFE does not return a GAIA ID, the  
15 app measurement data is stripped of certain pieces of information that could be used to personally  
16 identify the user who was using the device, and the app measurement data is logged only in  
17 “pseudonymous space” to the app measurement log. Google acts as a service provider to store,  
18 process, and analyze the app measurement data for the developer.

19 If the data was generated while WAA was off, the data is not written to [REDACTED] and  
20 therefore not used for personalized advertising purposes. Users also have the option to configure  
21 their device and account settings to control whether ads are personalized. *See, e.g.,*  
22 [https://support.google.com/accounts/answer/2662922#stop\\_goog\\_p13n](https://support.google.com/accounts/answer/2662922#stop_goog_p13n). If on a specific device,  
23 the user has enabled the LAT control on iOS or clicked “Don’t Allow” on the App Tracking  
24 Transparency prompt on iOS (v.14.5 and up), the pseudonymous app measurement data will not  
25 contain an IDFA. If the user has enabled the OOOAP control on Android, when app developers  
26 send app measurement data to Google through GA for Firebase, Google uses the OOOAP signal  
27 to ensure that the data associated with the user’s deviceID is not used for personalized advertising.

# Appendix A-23

Firebase is back at Google I/O on May 14! [Register now.](#)

([https://io.google/2024/?](https://io.google/2024/?utm_source=firebase&utm_medium=embedded_marketing&utm_campaign=&utm_content=)

[utm\\_source=firebase&utm\\_medium=embedded\\_marketing&utm\\_campaign=&utm\\_content=](https://io.google/2024/?utm_source=firebase&utm_medium=embedded_marketing&utm_campaign=&utm_content=))

## Log events

iOS+

✓ Android

Web

Flutter

This guide shows you how to log events in your app.

[Events](https://support.google.com/analytics/answer/9322688) (<https://support.google.com/analytics/answer/9322688>) provide insight on what is happening in your app, such as user actions, system events, or errors.

Analytics automatically logs some [events](https://support.google.com/analytics/answer/9234069) (<https://support.google.com/analytics/answer/9234069>) for you; you don't need to add any code to receive them. If your app needs to collect additional data, you can log up to 500 different Analytics Event types in your app. There is no limit on the total volume of events your app logs. Note that event names are case-sensitive and that logging two events whose names differ only in case results in two distinct events.

## Before you begin

Make sure that you've set up your project and can access Analytics as described in [Get Started with Analytics](#) (</docs/analytics/get-started?platform=android>).

## Log events

After you have created a `FirebaseAnalytics` instance, you can use it to log events with the

`logEvent()`

([/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics#logEvent\(java.lang.String,%20android.os.Bundle\)](/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics#logEvent(java.lang.String,%20android.os.Bundle)))

method.

To help you get started, the Analytics SDK defines a number of recommended events that are common among different types of apps, including retail and ecommerce, travel, and gaming apps.

To learn more [about these events](https://support.google.com/analytics/answer/9322688) (https://support.google.com/analytics/answer/9322688) and when to use them, see [Recommended events](https://support.google.com/analytics/answer/9267735) (https://support.google.com/analytics/answer/9267735).

**Note:** To get the maximum detail in reports, log the recommended events that make sense for your app and their prescribed parameters. This also ensures that you benefit from the latest Google Analytics features as they become available.

You can find implementation details for recommended event types in the following locations:

- Recommended events: see the [com.google.firebase.analytics.FirebaseAnalytics.Event](https://docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Event) (/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Event) class reference.
- Prescribed parameters: see the [com.google.firebase.analytics.FirebaseAnalytics.Param](https://docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Param) (/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Param) reference.

The following example demonstrates how to log a [SELECT\\_CONTENT](https://docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Event#SELECT_CONTENT)

(/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Event#SELECT\_CONTENT) event:

<a href="#">Kotlin+KTX</a>	<a href="#">Java</a>
<a href="#">Android</a>	<a href="#">Android</a>
<pre> firebaseAnalytics.logEvent(FirebaseAnalytics.Event.SELECT_ITEM) {     param(FirebaseAnalytics.Param.ITEM_ID, id)     param(FirebaseAnalytics.Param.ITEM_NAME, name)     param(FirebaseAnalytics.Param.CONTENT_TYPE, "image") } /analytics/app/src/main/java/com/google/firebase/example/analytics/kotlin/MainActivity.kt#L237-L241 </pre>	

In addition to the prescribed parameters, you can add the following parameters to any event:

- Custom parameters: Custom parameters can be used as [dimensions or metrics](https://support.google.com/analytics/answer/10075209) (https://support.google.com/analytics/answer/10075209) in [Analytics reports](https://support.google.com/analytics/answer/9212670) (https://support.google.com/analytics/answer/9212670). You can use custom dimensions for non-numerical event parameter data and custom metrics for any parameter data better represented numerically. After you've logged a custom parameter using the SDK, register the dimension or metric to ensure those custom parameters appear in Analytics reports. Do this using *Analytics > Events > Manage Custom Definitions > Create Custom Dimensions*

Custom parameters can be used in [audience](https://support.google.com/firebase/answer/6317509) (https://support.google.com/firebase/answer/6317509) definitions that may be applied to every report. Custom parameters are also included in data

exported to BigQuery (<https://support.google.com/firebase/answer/7030014>) if your app is linked to a BigQuery project. Find sample queries and much more at Google Analytics 4 BigQuery Export (<https://developers.google.com/analytics/bigquery>).

- **VALUE** parameter: VALUE

([/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Param#VALUE](https://docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics.Param#VALUE)) is a general purpose parameter that is useful for accumulating a key metric that pertains to an event. Examples include revenue, distance, time, and points.

If your application has specific needs not covered by a recommended event type, you can log your own custom events as shown in this example:

<u>Kotlin+KTX</u>	<u>Java</u>
<u>Android</u>	<u>Android</u>

```

firebaseAnalytics.logEvent("share_image") {
    param("image_name", name)
    param("full_text", text)
}
/analytics/app/src/main/java/com/google/firebase/example/analytics/kotlin/MainActivity.kt#L261-L264

```

## Set default event parameters

You can log parameters across events using [setDefaultEventParameters](#)

([/docs/reference/kotlin/com/google/firebase/analytics/FirebaseAnalytics#setDefaultEventParameters\(android.os.Bundle\)](https://docs/reference/kotlin/com/google/firebase/analytics/FirebaseAnalytics#setDefaultEventParameters(android.os.Bundle)))

. Default parameters are associated with all future events that are logged.

As with custom parameters, register the default event parameters to ensure they appear in Analytics reports.

<u>Kotlin+KTX</u>	<u>Java</u>
<u>Android</u>	<u>Android</u>

```

val parameters = Bundle().apply {
    this.putString("level_name", "Caverns01")
    this.putInt("level_difficulty", 4)
}

firebaseAnalytics.setDefaultEventParameter(parameters)

```

If a parameter is specified in the `logEvent()`

([/docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics#logEvent\(java.lang.String,%20android.os.Bundle\)](https://docs/reference/android/com/google/firebase/analytics/FirebaseAnalytics#logEvent(java.lang.String,%20android.os.Bundle)))

method, that value is used instead of the default.

To clear a default parameter, call the `setDefaultEventParameters`

([/docs/reference/kotlin/com/google/firebase/analytics/FirebaseAnalytics#setDefaultEventParameters\(android.os.Bundle\)](https://docs/reference/kotlin/com/google/firebase/analytics/FirebaseAnalytics#setDefaultEventParameters(android.os.Bundle)))

method with the parameter set to `null`.

## View events in the Android Studio debug log

You can enable verbose logging to monitor logging of events by the SDK to help verify that events are being logged properly. This includes both automatically and manually logged events.

You can enable verbose logging with a series of adb commands:

```
$ adb shell setprop log.tag.FA VERBOSE
```

```
$ adb shell setprop log.tag.FA-SVC VERBOSE
```

```
$ adb logcat -v time -s FA FA-SVC
```

This command displays your events in the Android Studio logcat, helping you immediately verify that events are being sent.

## View events in the dashboard

You can view aggregated statistics about your events in the Firebase console dashboards. These dashboards update periodically throughout the day. For immediate testing, use the logcat output as described in the previous section.

You can access this data from the **Events** ([https://console.firebase.google.com/project/\\_/analytics/events](https://console.firebase.google.com/project/_/analytics/events)) dashboard in the Firebase console. This dashboard shows the event reports that are automatically created for each distinct type of event logged by your app.

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